Easy Going

Mathematics (Higher)

YEAR 10

New specification

YEAR 10

(9 - 1)

Practice book

9 - 1

M.NAT

Acknowledgements

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M.Nat

First Edition 2017

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Designed by LEC direct.

GCSE (9 - 1)

Mathematics

Higher

YEAR 10

Practice questions

M. Nat

Edexcel & AQA new syllabus at a glance

(as specified by Edexcel's & AQA's official site)

The assessments will cover the following content headings:

1: Number

2: Algebra

3: Ratio, proportion and rates of change

4: Geometry and measures

5: Probability

6: Statistics

An overview of the structure:

- Two tiers are available: Foundation and Higher (content is defined for each tier).
- Each student is permitted to take assessments in either the Foundation tier or Higher tier.
- The qualification consists of three equally-weighted written examination papers at either Foundation tier or Higher tier.
- All three papers must be at the same tier of entry and must be completed in the same assessment series.
- The content outlined for each tier will be assessed across all three papers.
- Each paper has a range of question types; some questions will be set in both mathematical and non-mathematical contexts.
- Two assessment series available per year: May/June and November.
- First assessment series: May/June 2017.
- The qualification will be graded and certificated on a nine-grade scale from 9 to 1 using the total mark across all three papers where 9 is the highest grade.
- Foundation tier: grades 1 to 5.
- Higher tier: grades 4 to 9 (grade 3 allowed).

The assessment:

In all three papers, there is a mix of question styles, from short, single-marked questions to multi-step problems.

The mathematical demand increases as the student progresses through the paper.

The information below is the same for both Foundation and Higher tiers.

Paper 1: Non - calculator

- Written exam: 1 hour 30 minutes
- 80 marks
- Calculator not allowed
- $33\frac{1}{3}\%$ of the GCSE Mathematics assessment

Paper 2: Calculator

- Written exam: 1 hour 30 minutes
- 80 marks
- Calculator allowed
- $33\frac{1}{3}\%$ of the GCSE Mathematics assessment

Paper 3: Calculator

- Written exam: 1 hour 30 minutes
- 80 marks
- Calculator allowed
- $33\frac{1}{3}\%$ of the GCSE Mathematics assessment

Contents

Chapter 8: Angles

Chapter 9: Area & Perimeter

Chapter 10: Circles

Chapter 11: Linear Graph

Chapter 12: Algebra

Chapter 13: Algebraic fraction

Chapter 14: Shapes

Chapter 15: Trignometry

Chapter 16: Congruent triangles

Chapter 17: Circle theorems

Chapter 18: Similar shapes

Chapter 19: Algebra

Chapter 20: Real life graph

Chapter 21: Handling data

Chapter 22: Probability

Exercise 1A

Basic numbers

Q1 State for 18, 20 and 28:

a) their highest common factor _____

b) their lowest common multiple _____

Q2 P = { 12, 13, 10, 23, 25}. From the set P state:

a) two prime numbers _____

b) a triangular number _____

c) a square number _____

d) multiples of 2 _____

e) a factor of 39 _____

Q3 Express as a product of prime numbers.

a) 28 _____

b) 72 _____

c) 125 _____

Q4 List all the six factors of 18.

_____

Q5 Find the LCM of the following numbers.

a) 12, 24, 8 _____

b) 12, 36, 24 _____

c) 25, 5, 45 _____

Q6 Write down all the even numbers from this list.

46, 32, 33, 44, 25, 205, 202, 1002, 1001

_____

Q7 Write down the next two even numbers after:

a) 13 _____

b) 22 _____

c) 298 _____

Q8 Write down the odd number that comes before:

a) 14 _____ b) 1002 _____

Q9 Write down all the factor of the following numbers.

a) 36 _____ b) 32 _____

c) 46 _____

Q10 List the five multiples of the following numbers.

a) 3 _____ b) 7 _____

c) 12 _____ d) 10 _____

Exercise 1B

Basic numbers

Q1 Find the highest common factor of:

a) 21 and 35 _____ b) 16 and 24 _____

c) 35 and 45 _____ d) 42 and 84 _____

Q2 Find the lowest common multiple of:

a) 2 and 3 _____ b) 18 and 24 _____

c) 6 and 18 _____ d) 25 and 75 _____

Q3 Peter writes down the numbers from 3 to 40. He crosses out all the multiples of 2. He crosses out all the multiples of 3 and then all the multiples of 5.

a) Which numbers are crossed out more than once?

_____

b) Which numbers have not been crossed out at all?

_____

Q4 Calculate the answer to the following questions.

a) Express 104 as the product of its prime factors.

_____

b) Find the highest common factor of 104 and 24.

_____

Q5 a) Find the highest common factor of the numbers 16 and 40.

_____

b) The number 40 expressed as the product of its prime factors, in index form, is given by $2^3 \times 5$.

Express 90 as the product of its prime factors in index form.

_____

c) Use your answer to *b)* to write 40×90 as the product of its prime factors in index form. Simplify your answer.

_____

Exercise 2A

Simplifying

Q1 Cancel these fractions to their lowest terms.

a) $\frac{56}{84}$ _____

b) $\frac{60}{150}$ _____

c) $\frac{168}{480}$ _____

d) $\frac{275}{345}$ _____

e) $\frac{35}{60}$ _____

Q2 Change these mixed fractions to improper fractions.

a) $2\frac{1}{4}$ _____

b) $4\frac{11}{14}$ _____

c) $5\frac{3}{15}$ _____

d) $7\frac{7}{11}$ _____

e) $7\frac{19}{25}$ _____

Q3 Change these improper fractions to mixed fractions.

a) $\frac{9}{4}$ _____

b) $\frac{125}{8}$ _____

c) $\frac{47}{5}$ _____

d) $\frac{83}{25}$ _____

e) $\frac{49}{10}$ _____

Q1 Add these simple fractions. Simplify the fractions if required.

a) $\frac{5}{7}+\frac{1}{7}$

b) $\frac{1}{8}+\frac{5}{16}$

c) $6\frac{2}{3}+1\frac{1}{3}$

d) $\frac{9}{16}+\frac{19}{32}$

e) $3\frac{5}{10}+2\frac{3}{4}$

Q2 Subtract these simple fractions. Simplify the fractions if required

a) $1-\frac{12}{13}$

b) $\frac{3}{4}-\frac{3}{8}$

c) $5\frac{3}{4}-2\frac{1}{2}$

d) $4\frac{1}{2}-1\frac{7}{16}$

e) $5\frac{7}{8}-4\frac{11}{16}$

Exercise 2C

Multiplication & Division

Q1 Multiply the following fractions. Simplify the fractions if required

a) $\frac{5}{12} \times \frac{3}{10}$

b) $\frac{6}{25} \times \frac{35}{54}$

c) $36 \times \frac{3}{8}$

d) $\frac{7}{8} \times \frac{16}{21}$

e) $\frac{3}{5} \times \frac{25}{72}$

Q2 Divide the following fractions. Simplify the fractions if required

a) $\frac{21}{2} \div \frac{9}{4}$

b) $\frac{27}{2} \div \frac{21}{4}$

c) $\frac{4}{7} \div 7$

d) $\frac{28}{9} \div \frac{14}{3}$

e) $\frac{9}{4} \div \frac{15}{27}$

Exercise 2D

Problems in Fraction

Q1 Work out the answers by either increasing or decreasing the following numbers by the fractions given.

a) increase 35 by $\frac{3}{7}$

c) decrease 40 by $\frac{7}{8}$

e) increase 56 by $\frac{3}{7}$

b) increase £27.36 by $\frac{5}{6}$

d) decrease 99 by $\frac{9}{11}$

f) decrease 121 by $\frac{9}{11}$

Q2 Write the first as a fraction of the second (give the answer in the simplified form).

a) 40km, 140km

b) 60km, 120km

c) 50km, 100km

d) 140km, 280km

e) 45mm, 135mm

f) 45mm, 180mm

g) 100g, 200g

h) 145mm, 580mm

i) 40mm, 20cm

j) 40mm, 8cm

k) 5kg, 10000g

l) 240mm, 96cm

Q1 Place the following decimals in ascending order.

a) 4.007, 4.108, 4.058 _____

b) 0.88, 0.78, 0.078, 0.178 _____

c) 0.234, 0.75, 0.725, 2.36 _____

d) 99.6, 99.2, 8.9, 8.93 _____

Q2 Round each of these decimal numbers to the appropriate decimal point.

		(i) 1 d.p.	(ii) 2 d.p.	(iii) 3 d.p.
a)	0.9814	(i) _____	(ii) _____	(iii) _____
b)	7.71491	(i) _____	(ii) _____	(iii) _____
c)	0.5738	(i) _____	(ii) _____	(iii) _____
d)	13.7801	(i) _____	(ii) _____	(iii) _____
e)	0.0035	(i) _____	(ii) _____	(iii) _____

Q3 Round each of these numbers to the appropriate significant figures.

		(i) 1 s.f.	(ii) 2 s.f.	(iii) 3 s.f.
a)	0.70024	(i) _____	(ii) _____	(iii) _____
b)	8.43261	(i) _____	(ii) _____	(iii) _____
c)	0.73464	(i) _____	(ii) _____	(iii) _____
d)	515.07	(i) _____	(ii) _____	(iii) _____
e)	4502.46	(i) _____	(ii) _____	(iii) _____

Exercise 3A — Simplifying

Q1 Simplify:

a) 3 : 9 _____ b) 135 : 1000 _____

c) 425 : 225 _____ d) 900m: 1.4km _____

Q2 Express these ratios in the form of 1 : n.

a) 2mm : 3m _____ b) 2.8kg : 300g _____

c) 5 : 1 _____ d) 6 : 8 _____

e) 2 : 4 _____

Q3 Find the missing number in each question.

a) 2 : 1 = x : 4 _____ b) 3 : 2 = x : 5 _____

c) 1 : 6 = x : 2 _____ d) 7 : 3 = x : 13 _____

e) 1 : 7 = x : 105 _____

Q4 Two rulers are in the ratio 7:2. The smaller length is 56cm. Find the larger length.

_____

_____

Q5 The total number of people stayed in a small hotel and a big hotel had a ratio of 3 : 5. 36 people stayed in the small hotel. How many people stayed in the big hotel?

_____

_____

_____

Q6 The ratio of the number of the people attending a school day on Wednesday and Thursday was 2 : 3. On Wednesday 190 pupils attended. How many pupils attended on Thursday?

_____

_____

Q7 There are 300 boys and 750 girls in the school. Find the ratio of girls to boys. Give your answer in the simplified form.

_____

_____

Q8 There are 420 books in a library. 120 are fictions, 80 are children books and the rest are international reading books. Find the ratio of fictions to international books.

_____

_____

Q9 Diluxon and Bamela have £72 in their hand. They have to divide this in the ratio of 2 : 7. How much will Diluxion and Bamela get?

_____

_____

Q10 There are 1000 pupils studying in a school. 400 are boys. Find the ratio of the boys to girls.

_____

_____

Exercise 4A

Simple Interest

Q1 Answer the following questions, which are simple interest. Show your workings

a) £1600 is deposited in a bank paying 4% simple interest per annum. How much interest will have been paid for the 5 years?

_____
_____
_____

b) £600 is deposited in a bank paying 0.45% simple interest per annum. How much interest will have been paid for the 4 years?

_____
_____
_____

c) c) £1500 is deposited in a bank paying 1.25% simple interest per anum. How much interest will have been paid for the 8 years?

_____
_____
_____

d) £8000 is deposited in a bank paying 4.5% simple interest per annum. How much interest will have been paid for the 8 years?

_____
_____
_____

e) £6400 is deposited in a bank paying 7.5% simple interest per annum. How much interest will have been paid for the 12 years?

_____
_____
_____

Exercise 4B

Percentage increase & decrease

Q1 Answer the following

a) Increase 160 by 110%

b) Decrease 180 by 55%

c) Decrease 60 by 40%

d) Increase 20 by 80%

e) Decrease 80 by 30%

f) Increase 40 by 50%

g) Decrease 240 by 85%

h) Increase 520 by 80%

i) Increase 80 by 45%

j) Decrease 160 by 90%

k) Increase 20 by 80%

l) Decrease 20 by 65%

m) Decrease 120 by 10%

n) Decrease 480 by50%

o) Increase 160 by 120%

p) Increase 160 by 105%

q) Decrease 80 by 75%

r) Increase 180 by 60%

Exercise 5A | **Indices**

Q1 Simplify the following indices

a) $2^4 \times 2^6$

b) $3^{-3} \times 3^5$

c) $4^4 \times 4^{-6}$

d) $\dfrac{2^3 \times 2^6}{2^5}$

e) $\dfrac{3^{-3} \times 3^5}{9}$

f) $\dfrac{(7^4)^2 \times 7^{-3}}{(7^2)^4}$

g) $\dfrac{(3^2)^4 \times (3^{-2})^4}{3^4}$

h) $\dfrac{a^4 \times b^5 \times a^{-2}}{(ab)^5}$

i) $\dfrac{(ab)^4 \times (a^2b)^2}{(ab)^3}$

j) $\dfrac{(5^2)^3 \times (5^2)^4}{5^5}$

k) $\dfrac{p^6 \times q^5 \times p^{-3}}{(pq)^2}$

l) $\dfrac{(7)^4 \times (49)^2}{(7)^3}$

m) $\dfrac{(5^2)^4 \times (5^{-2})^4 \times 125}{5^4}$

n) $\dfrac{p^6 \times p^5 \times p^{-3}}{(p)^5}$

o) $\dfrac{(8)^2 \times (64)^2}{(8)^6}$

Exercise 6A

Converting numbers

Q1 Change the following numbers into standard form.

a) 76 _____ b) 26.4 _____ c) 0.0028 _____

d) 1076 _____ e) 10.76 _____ f) 0.0168 _____

g) 0.0003 _____ h) 12768 _____ i) 0.12678 _____

j) 0.02345 _____ k) 126.98 _____ l) 0.00123 _____

m) 0.00001 _____ n) 76.98 _____ o) 0.0209 _____

p) 2367.09 _____ q) 0.000056 _____ r) 2675 _____

s) 0.0987 _____ t) 0.8976 _____

Q2 Change the following numbers into ordinary numbers.

a) 2×10^2 _____ b) 3×10^{-3} _____

c) 4×10^{-4} _____ d) $2 \times 10^2 \times 6 \times 10^2$ _____

e) $2 \times 10^2 + 3 \times 10^3$ _____ f) $7 \times 10^{-2} + 8 \times 10^3$ _____

g) $(8 \times 10^4) \div (4 \times 10^{-2})$ _____ h) $9 \times 10^7 - 4 \times 10^2$ _____

i) $7 \times 10^4 - 4 \times 10^4$ _____

j) $3 \times 10^3 \times 4 \times 10^4$ _____

Exercise 7A

Substitution

Q1 Use a = 2, b = -2, c = 6 and d = 4 to calculate the value of the following questions

a) ab

b) 2ab - c

c) $3a^2b - c$

d) 7(c + d)

e) 2(ad - cb)

f) $a^3b - b^3c + ab$

Q2 Use a = 2, b = -2, c = 6 and d = 4 to calculate the value of the following questions

a) $\frac{ab + cd}{ab - cd}$

b) $\frac{a^2b - c^2}{cd^2}$

c) $\frac{a^3b - c^2}{cd^2}$

d) $\frac{a^3 - b^3}{ab}$

e) $\frac{a^3 + b}{c^2d}$

f) $\frac{ab - a^2c}{c^2d}$

g) $\frac{abc}{a^2 + b^2}$

h) $\frac{a^3c - b^2}{cd}$

i) $\frac{c^2d}{a^3 - d^2}$

Q3 Substitute the given values to find the answers.

a) For the equation $y = a^2b - c$, find the value of y when a= 3, b = -2 and c = 6.

_____

_____

b) For the equation $s = ut + \frac{1}{2} at^2$, find the value of s when u = 8, t=2 and a = 5.

_____

_____

c) For the equation: $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ find the value of f when v = 4 and u = -2

_____

_____

d) For the equation $E = mgh$, Find the value of h when E = 40, m = 2 and g = 10.

_____

_____

e) For the equation $E = \frac{1}{2} mv^2$, Find the value of m when E = 125 and v = 5.

_____

_____

f) For the equation $y = \frac{1}{2}(P + Q)$, find the value of Q when y = 32 and P = 8.

_____

_____

g) For the equation $E = mgh + \frac{1}{2} mv^2$, find the value of E when m = 2, g = 10, h = 4 and v = 5.

_____

_____

Exercise 7B

Expanding Brackets

Q1 Multiply out the brackets and simplify your answers if required

a) $4\,(x - 5)$

b) $3(x - 3)$

c) $-4(a - b)$

d) $-3(-a + 2)$

e) $a(a-2)$

f) $a(2a - 3)$

g) $7(x - 5)$

h) $9(ab - xy)$

i) $10(-a + 8)$

Q2 Multiply out the brackets and simplify your answers.

a) $2(a - 2) + 3(a - 5)$

b) $7(a - 7) - 2(a - 2)$

c) $10(a + 5) - 4(a + 4)$

d) $9(a - 4) - 8(a + 3)$

e) $7 - 3(x - 2)$

f) $-5(a - b) + 2(a + b)$

g) $5x(2 - 3x) + x(2x + 3)$

h) $7(a - 8) - 3(a + 7)$

i) $2x + x(2 + x) - 3x^2$

j) $6y - y(2y - 4)$

k) $9a + 2a(7a - 5)$

l) $7y - 2x(2 - y) - 4xy$

m) $7(x - 4) - 5(x - 6)$

n) $x^3(x - 4)$

o) $7x(x - 3) - x^2$

Q3 Multiply out the brackets and simplify your answers.

a) $(a - 5)(a - 3)$

b) $(x - 5)(x - 7)$

c) $(2a - 5)(a - 5)$

d) $(3a - 5)(4a - 5)$

e) $(7a - 5)(6a - 5)$

f) $(3a - 5)(a + 5)$

g) $(a + 5)(a - 5)$

h) $(7x - 5y)(x - y)$

i) $(2x - 3y)(7x - y)$

j) $(4x - y)(5x - y)$

k) $(5y - 6)(2x - 3)$

l) $(a - b)(2a - b)$

m) $(3 - x)(4 - x)$

n) $(3a - 4)(2a - 1)$

o) $(7x - 4)(-x + 2)$

Q4 Expand the followings and give your answer in simplified form.

a) $(x + 3)^2$

b) $(x - 9)^2$

c) $(2x - 3)^2$

d) $(3y - 7)^2$

e) $(4y + 3)^2$

f) $(3a - 1)^2$

g) $(a - b)^2$

h) $(2p - 3)^2$

i) $(5x - 7)^2$

j) $(5a - 3)^2$

k) $(6x - 3)^2$

l) $(x - 7)^2$

m) $(x - 5)^2$

n) $(2x - 7)^2$

o) $(9x - 7)^2$

p) $(4x - 5)^2$

q) $(3x - 5)^2$

r) $(2x - 9)^2$

s) $(9x - 5)^2$

t) $(7x - 7)^2$

u) $(10x - 7)^2$

Exercise 7C

Common Factors

Q1 Factorise the following expressions

a) $3x + 6$ _____

b) $5x - 5$ _____

c) $5x - 25$ _____

d) $xy + xyz$ _____

e) $11x + 22$ _____

f) $7x - 28$ _____

g) $x^2y + xy$ _____

h) $15x - 25$ _____

i) $xz + yz$ _____

j) $9x - 27$ _____

k) $9x^2 - 9y$ _____

l) $3x + 12$ _____

m $12x - 4$ _____

n) $-7x + 14$ _____

o) $2x^4 - x^3$ _____

Q2 Factorise the following expressions

a) $x^2y + xy^2 - 2xyz$ _____

b) $9x^2 - 12x + x^3$ _____

c) $7xyz - 2y^2z + 3xy^2z$ _____

d) $11x^4 + 22x^2 + 121x^3$ _____

e) $\frac{1}{3}ab + \frac{1}{2}by$ _____

f) $2\pi r - \pi r^2$ _____

g) $7\pi r^2 - 3\pi rh$ _____

h) $\frac{1}{2}ut^2 - \frac{1}{3}uv^2$ _____

i) $x + \frac{xyz}{110}$ _____

Q3 Factorise the following questions by grouping into two

a) $6x^3 - 10x^2 + 3x - 5$

b) $20y^3 - 15y^2 + 12y - 9$

c) $6a^3 - 9a^2 + 10a - 15$

d) $5x^3 - 15x^2 + x - 3$

e) $3p^3 + 15p^2 + 4p + 20$

f) $xa + xb + ya + yb$

g) $4v^3 - 3v^2 + 24v - 18$

h) $2x^3 - 4x^2 + 5x - 10$

i) $x^3 + 2x^2 + x + 2$

j) $4y^3 + 20y^2 + 5y + 25$

k) $15p^3 - 9p^2 + 5p - 3$

l) $9a^3 + 12a^2 + 12a + 16$

m) $10xy + 14x + 15y + 21$

n) $3xy - 24x^2 - 7y + 56x$

Exercise 7D

Quadratic Factors

Q1 Factorise the following quadratic equations.

a) $x^2 + 9x + 18$

b) $x^2 + 11x + 24$

c) $x^2 + 15x + 36$

d) $x^2 + 21x + 108$

e) $x^2 - 3x + 2$

f) $x^2 + 4x + 3$

g) $x^2 - 6x + 9$

h) $x^2 - 5x + 6$

i) $x^2 + 7x + 10$

j) $x^2 - 11x + 24$

k) $x^2 - 12x + 27$

l) $x^2 - 15x + 36$

m) $x^2 - 9x + 18$

n) $x^2 - 13x + 36$

o) $x^2 - 3x - 28$

p) $x^2 - 7x - 18$

Q2 Factorise the following quadratic equations.

a) $x^2 - 11x - 12$

b) $x^2 - 2x - 24$

c) $p^2 - 5p - 14$

d) $a^4 - 4a^2 - 12$

e) $x^2 - 8x - 48$

f) $y^2 - 9y + 8$

g) $P^2 - 7p + 10$

h) $P^2 - 6P + 8$

Q3 Factorise the following quadratic equation

a) $7y^2 - 31y - 20$

b) $5x^2 - x - 18$

c) $10y^2 + 89y - 9$

d) $2x^2 + 6x + 4$

e) $7a^2 - 45a - 28$

f) $4x^2 + 12x + 9$

g) $9a^2 + 3a - 56$

h) $9x^2 - 27x + 18$

Exercise 7E

Difference of two squares

Q1 Factorise the difference of squares.

a) $x^2 - 9$

b) $x^2 - 1$

c) $25x^2 - 9y^2$

d) $1 - 4x^2$

e) $p^2 - 64$

f) $x^2 - 4^2$

g) $-16 + x^2$

h) $m^2 - k^2$

i) $y^2 - 64$

j) $x^2 - 100$

k) $p^6 - 36$

l) $x^4 - 144$

m) $(x^2)^2 - 1$

n) $x^2 - 49$

o) $4y^2 - 16$

d) $121 - y^2$

Exercise 7F

Changing the subject of a formula

Q1 Make the term in the brackets as the subject of the formula.

a) $y = mx + c$ (m)

b) $a(b + x) = c$ (x)

c) $a(x - b) = c$ (x)

d) $bx = a - c$ (x)

e) $ax + t = b$ (x)

f) $x = 2y + t$ (y)

g) $ax - y = t$ (x)

h) $ax - e = b$ (x)

i) $9x - y = 8$ (y)

j) $a + 5y = b$ (y)

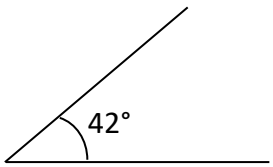
k) $2x + 3y = 4$ (x)

Exercise 8A

Introduction to Angles

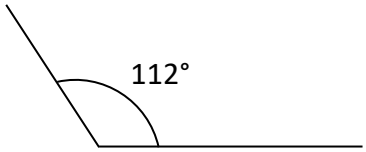
Q1 Name the following angles.

a)



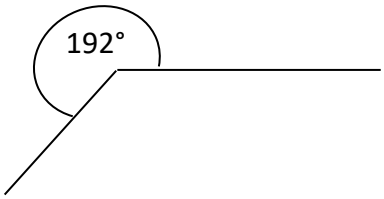
_____

b)



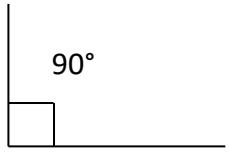
_____

c)



_____

d)



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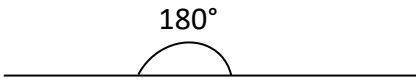
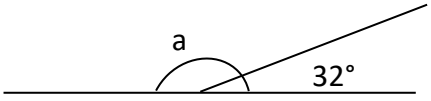
e)



Q2 Find the unknown angles.

a)



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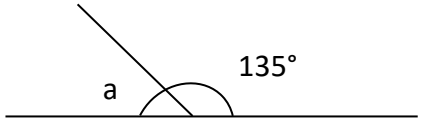
b)



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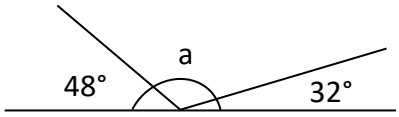
c)



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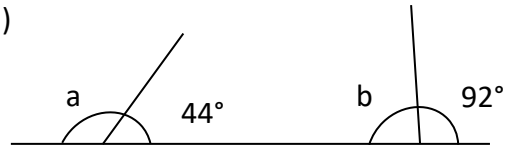
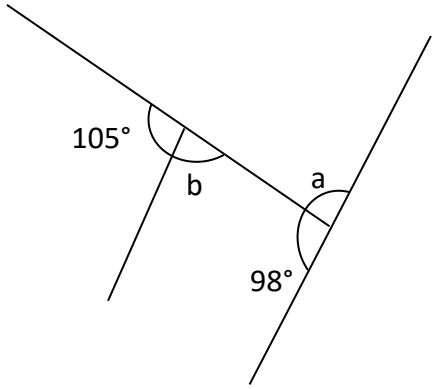
d)



_____.

e)



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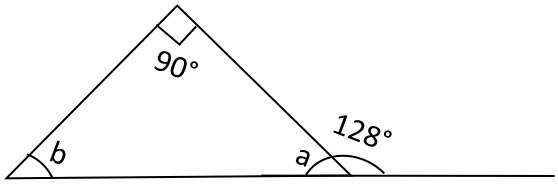
Exercise 8B

Triangles

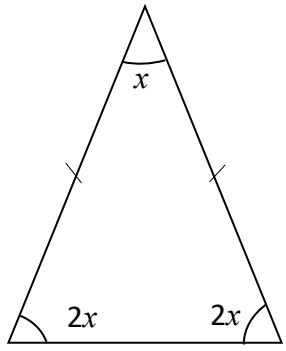
Q1 Find the unknown angles.

a)



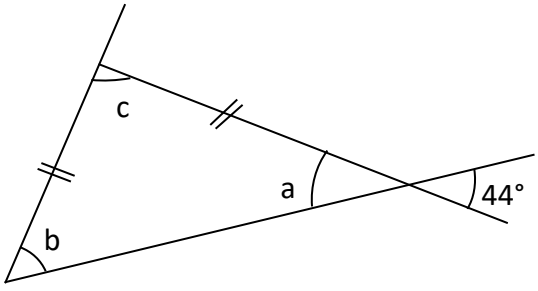
_____.

b)



_____.

c)



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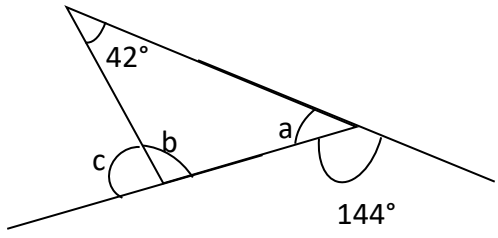
d)



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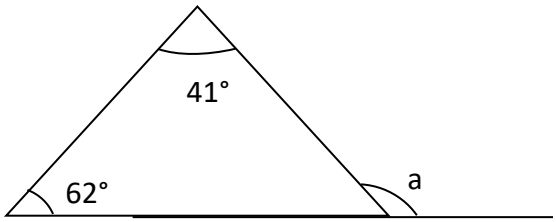
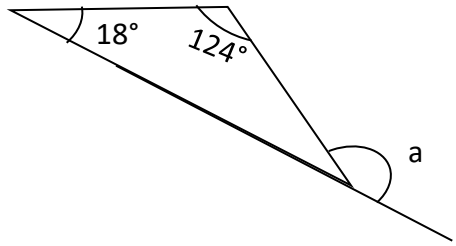
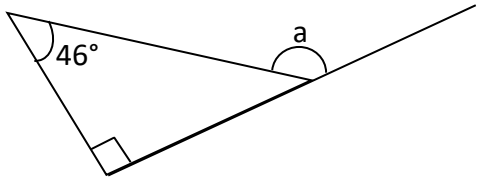
e)



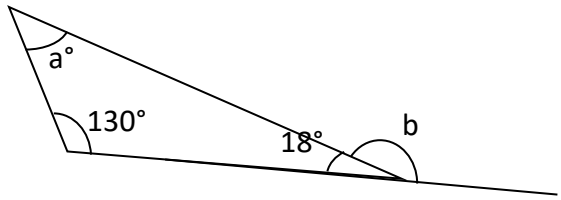
f)



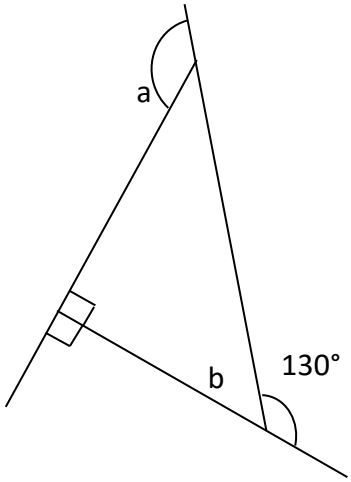
g)



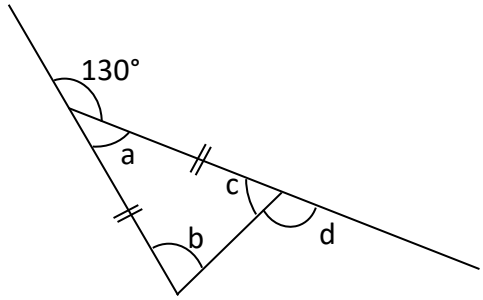
h)



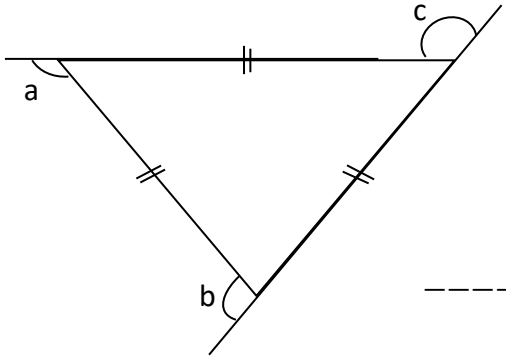
i)



j)



k)

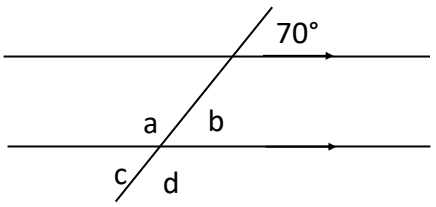


Exercise 8C

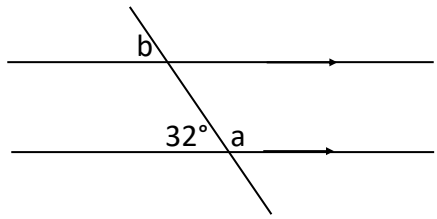
Parallel line calculations

Q1 Find the unknown angles.

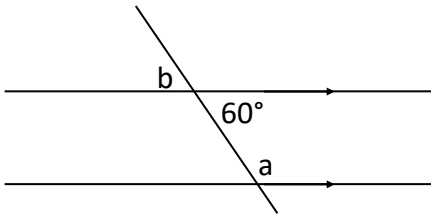
a)



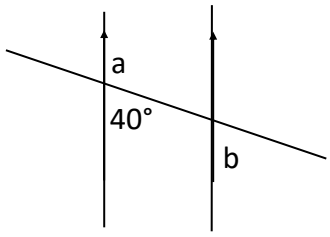
b)



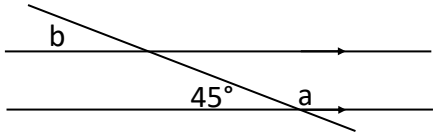
c)



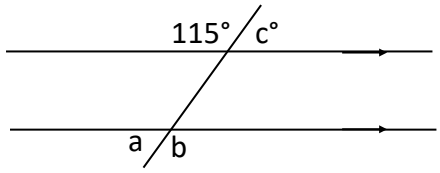
d)



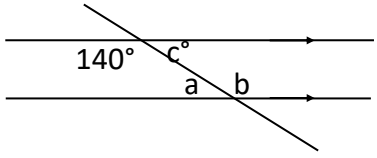
e)



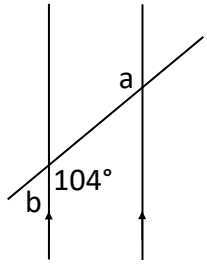
f)



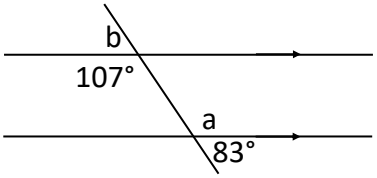
g)



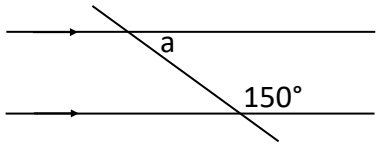
h)



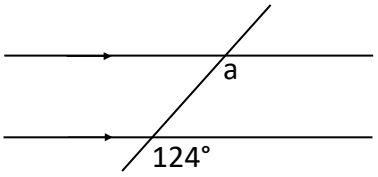
i)



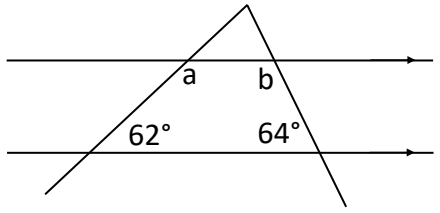
j)



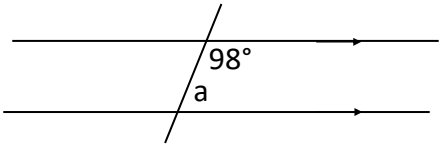
k)



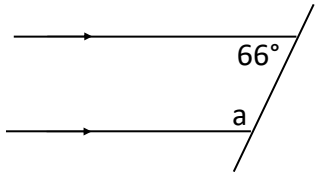
l)



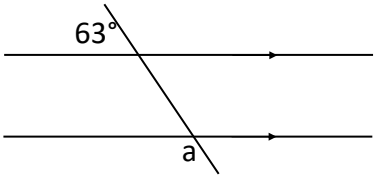
m)



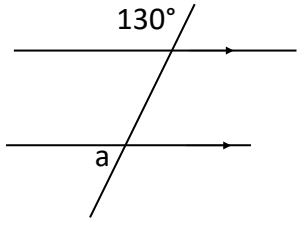
n)



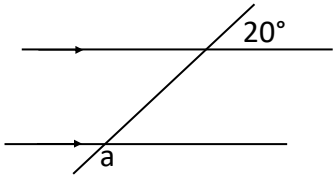
o)



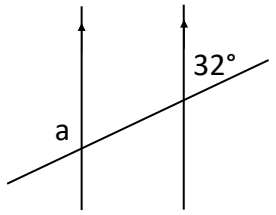
p)



q)



r)

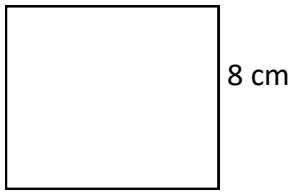


Exercise 9A

Finding the area of the shapes

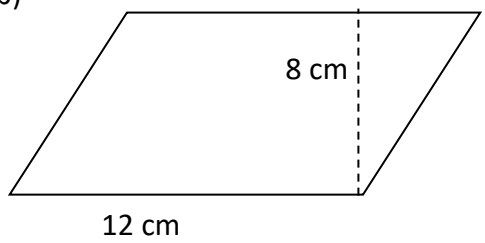
Q1 Find the area of each shape, remember to write the units as well.

a)



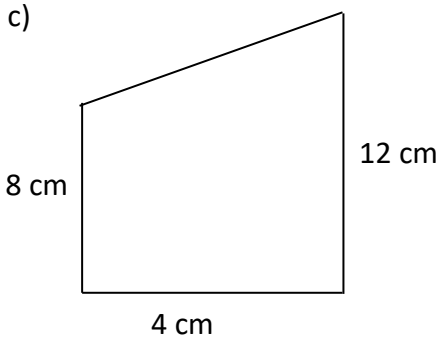
_____

b)



_____

c)



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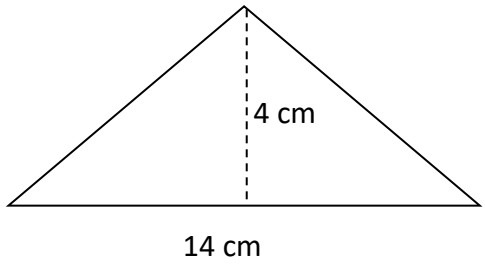
d)



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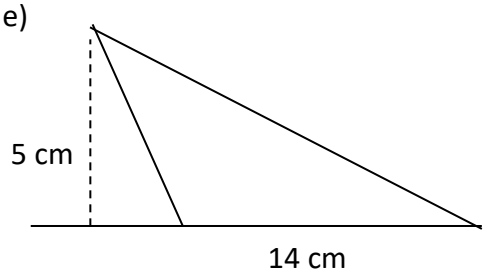
e)



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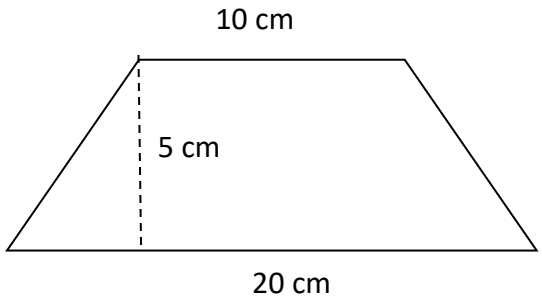
f)



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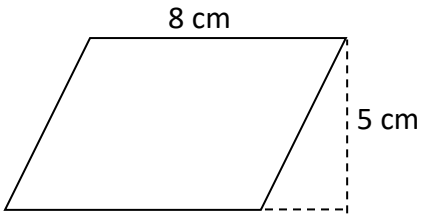
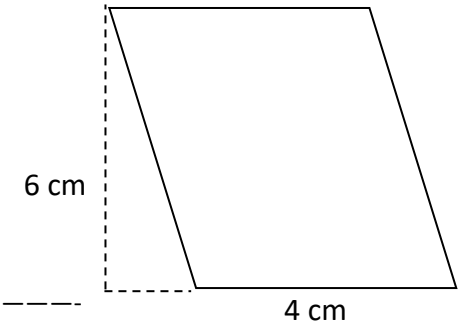
g)


8 cm
5 cm

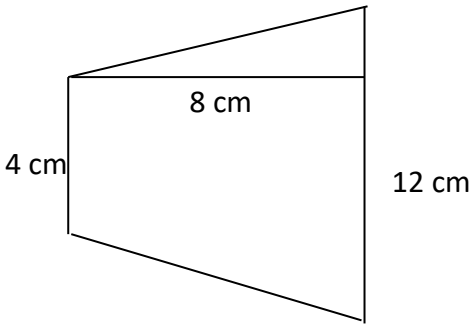
_____

h)


6 cm
4 cm

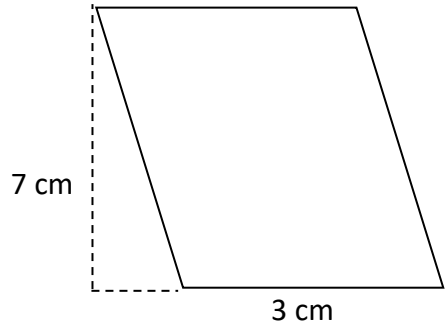
_____

i)


8 cm
4 cm
12 cm

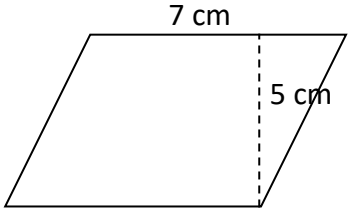
_____

j)


7 cm
3 cm

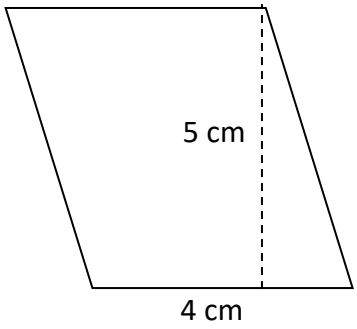
_____

k)


7 cm
5 cm

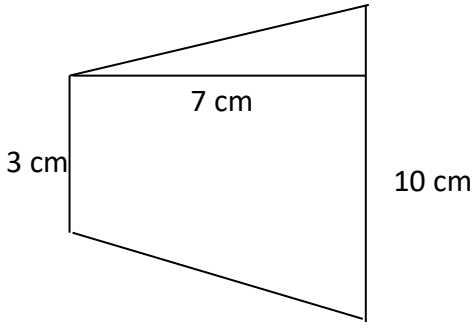
_____

l)


5 cm
4 cm

_____

m)


7 cm
3 cm
10 cm

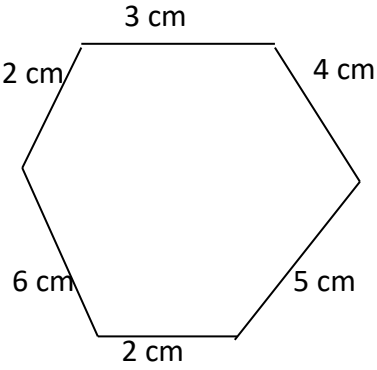
_____

Exercise 9B

Finding the perimeter of the shapes

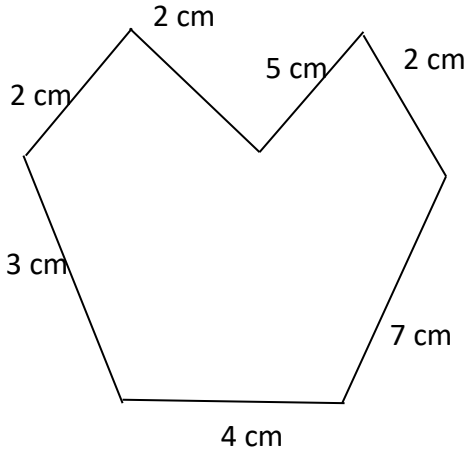
Q1 Find the perimeter of the following shapes

a)



———————————-

b)



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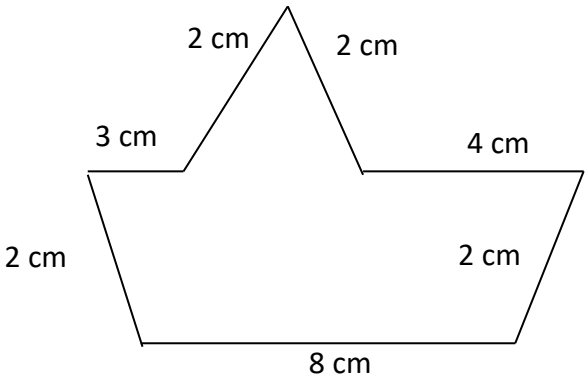
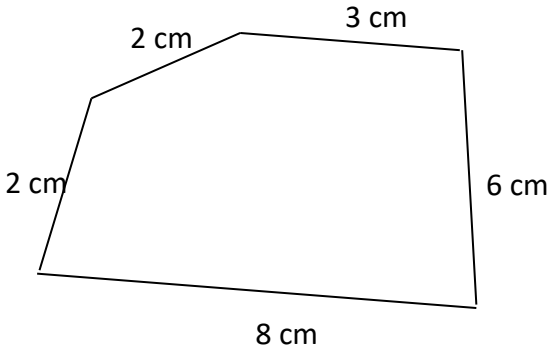
c)



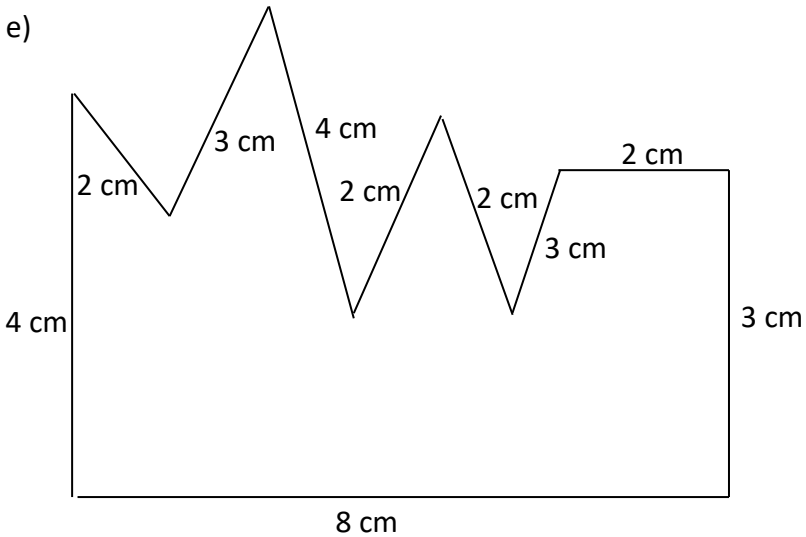
———————————-

d)



———————————-

e)



———————————-

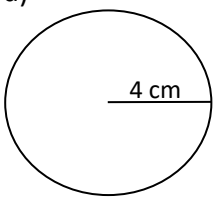
Exercise 10A

Finding the area & circumference

Q1 Find the area and the circumference of the following circles.

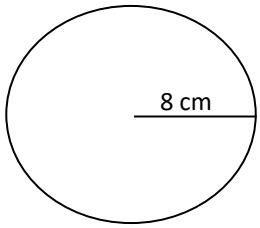
Find the a) area and b) the circumference of the circles. Give your answer in 2 d.p.

a)



____ ____

b)



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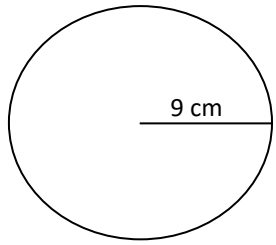
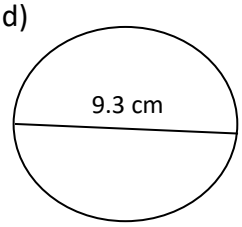
c)



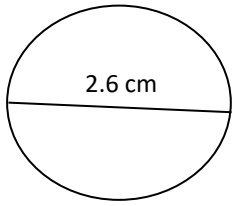
____ ____

d)



____ ____

e)



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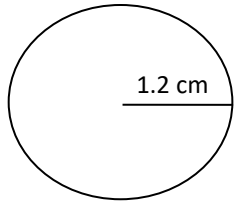
f)



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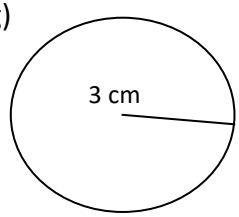
g)



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h) Find the diameter of the circle with a circumference of 6.1 mm. ……

i) Calculate the area of the circle with a circumference of 1.6 cm. ……

j) What is the circumference of a circle with an area of 8 mm^2? ……

k) The area of a circle is 9.6 m^2, calculate the circumference of the circle? ……

l) Calculate the circumference of a circle with an area of 5.3 cm^2. ……..

Linear Graph

Chapter 11

Exercise 11A

Drawing Graphs

Q1 In each questions copy and complete the table. On graph paper draw x and y axes for the ranges indicated in the brackets. Mark the points and draw

a) $y=x+6$ $\quad -2 \le x \le 1, \quad 0 \le y \le 8$

x	-2	-1	0	1
y				

b) $y = 7 - x,$ $\quad -3 \le x \le 4, \quad 0 \le y \le 9$

x	-2	0	2	4
y				

c) $y = 2x + 1$ $\quad -2 \le x \le 4, \quad 0 \le y \le 5$

x	-1	0	1	2
y				

d) $y = -4x + 1$ $\quad -3 \le x \le 4, \quad -15 \le y \le 9$

x	-2	0	2	4
y				

e) $y = \frac{1}{4}x + 2$ $\quad -2 \le x \le 4, \quad 0 \le y \le 3$

x	-2	0	2	4
y				

f) $y = 3 - 2x$ $\quad -2 \le x \le 4, \quad -5 \le y \le 7$

x	-2	0	2	4
y				

g) $y = 5 - 4x$ $\quad -2 < x \le 5 \quad 7 \le y \le 17$

x	-3	0	3
y			

h) $y = 7 + 3x$ $\quad 1 \le x \le 5 \quad 0 \le y \le 22$

x	1	3	5
y			

i) $y = -2x + 5$ $\quad -2 < x < 5, \quad 0 \le y \le 7$

x	-3	0	3
y			

j) $y = -7x + 3$ $\quad -4 \le x \le 4, \quad -18 \le y \le 24$

x	-3	0	3	6
y				

Exercise 11B

Using own numbers for x

In the following questions, choosing your own values of x within the given range, draw and y axes for the ranges of values indicated. Draw the line. in your book.

a) $y = 2x - 7$ $\quad 2 \le x \le 4$

x			
y			

b) $y = 4x - 3$ $\quad -3 \le x \le 5$

x								
y								

c) $y = -\frac{1}{2}x + 5$ $\quad -2 \le x \le 4$

x							
y							

d) $y = -3x + 7$ $\quad -4 \le x < 2$

x							
y							

e) $y = 7 - 3x$ $\quad -3 \le x \le 3$

x							
y							

f) $y = 3x - 8$ $\quad -2 \le x \le 3$

x						
y						

Exercise 12A | **Simultaneous Equations - One step elimination**

Q1 Find the values of x and y.

a) $x + y = 4$

$x - y = 2$

b) $x + y = 10$

$x - y = 8$

c) $4x - y = 10$

$x - y = 1$

d) $5x - y = 12$

$2x + y = 16$

e) $3x - 2y = 12$

$2x + 2y = 13$

f) $4x + 2y = 10$

$-4x + 3y = 5$

g) $8x + 7y = 2$

$2x - 7y = 18$

h) $10x + y = 25$ _____

$3x - y = 1$ _____

_____

_____

_____

_____

i) $5x - 3y = -2$ _____

$-5x + y = 4$ _____

_____

_____

_____

_____

j) $3x + y = 7$ _____

$2x - y = 3$ _____

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_____

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_____

Q2 Find the values of x and y.

a) $8x + 3y = 9$

$4x + 3y = 6$

b) $11x - 5y = 3$

$8x - 5y = 9$

c) $9x - 7y = 15$

$6x - 7y = 3$

d) $5x + 2y = 9$

$2x + 2y = 6$

e) $9x + 2y = 22$

$7x + 2y = 2$

f) $7x + 4y = 32$

$5x + 4y = 16$

g) $7x - y = 12$

$5x - y = 2$

h) $11x - 2y = 28$

$9x - 2y = 4$

i) $13x + 5y = 25$ _____

$12x + 5y = 20$ _____

_____

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Exercise 12C **Simultaneous Equations - Three step elimination**

Q3 Find the values of x and y.

a) $5x - 4y = 7$ _____

$7x - 2y = 17$ _____

_____

_____

_____

_____

b) $4x + 2y = 8$ _____

$x + 3y = 2$ _____

_____

_____

_____

_____

d) $6x - y = -4$

$3x - 2y = 1$

e) $8x + 3y = 27$

$x - y = 2$

f) $3x + 2y = 21$

$2x - y = 7$

g) $5x - 4y = 7$

$7x - 2y = 17$

h) $6x - 3y = 0$

$5x - 2y = 4$

i) $x + 2y = 0$

$5x - 5y = 15$

k) $3x + 2y = 3$

$2x + y = 23$

l) $2x + 3y = 5$

$3x - 2y = 1$

Q4 Find the values of x and y.

a) $y + 1 = 2x$

$y = x + 2$

b) $3y - 2x = -38$

$y = 3x - 43$

c) $y - x = -16$

$y = 7x - 76$

d) $7y - 3x = 13$

$y = x - 5$

e) $8y - 5x = 73$

$y = x - 3$

f) $3x + 8y = 24$

$y = 3 - x$

g) $5y + 3x = -3$

$y = -4x - 4$

h) $6y - 13x = 72$

$y = -x - 7$

I) $7y - 5x = 32$

$y = x - 6$

j) $y - 2x = 18$

$y = x - 2$

k) $4x - 5y = 22$

$y = x - 2$

l) $2y - 6x = 12$

$y = 6x + 3$

m) $5y + 4x = 59$

$y = 4x - 17$

n) $9y - 2x = 43$

$y = x - 3$

o) $2x - 3y = -1$

$x = -2y + 10$

p) $11y - 4x = 74$

$x = y + 6$

q) $12y - 3x = 96$

$x = y - 5$

r) $11x - 5y = 76$

$x = 4 - y$

Algebraic Fraction

Chapter 13

Exercise 13A

Simplifying fractions

a) $\frac{5x}{x}$

b) $\frac{5x^2}{2x}$

c) $\frac{x^2+x}{x+1}$

d) $\frac{x^3+x^2}{x(x+1)}$

e) $\dfrac{x^4 - x^2}{x^2(x - 1)}$

f) $\dfrac{x^2 - 9}{x + 3}$

g) $\dfrac{x^2 - 16x}{x(x - 4)}$

h) $\dfrac{x^2 + 5x^2 + x}{6x}$

i) $\dfrac{x^2 + 3x + 2x}{2x}$

Exercise 13B

Addition and Subtraction of fractions

a) $\frac{3}{x} + \frac{4}{x}$

b) $\frac{2}{5x} + \frac{3}{10x}$

c) $\frac{7}{8x} + \frac{1}{2x}$

d) $\frac{10}{11x} + \frac{12}{13x}$

e) $\frac{2}{x} + \frac{3}{x^2}$

f) $\frac{9}{7x} - \frac{3}{4x}$

g) $\frac{7}{12x} - \frac{3}{24x}$

h) $\frac{11}{12x} - \frac{3}{4x}$

i) $\frac{3x}{8} - \frac{2x}{5}$

j) $\frac{x}{2} + \frac{2x}{3}$

Work out these additions. Answer as a single fraction

a) $\frac{x+1}{3} + \frac{x+2}{2}$

b) $\frac{2x+1}{11} + \frac{3x+2}{3}$

c) $\frac{y+3}{8} + \frac{y+1}{16}$

d) $\frac{x-3}{2} + \frac{2-x}{3}$

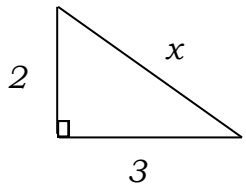
e) $\frac{7}{x+1} + \frac{3}{x+2}$

Exercise 14A

Pythagoras theorem

Finding hypotenuse.

a)



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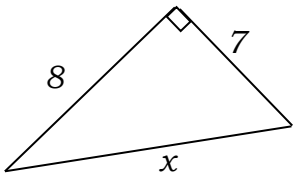

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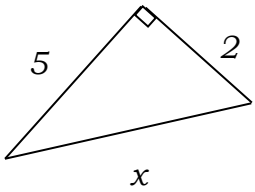

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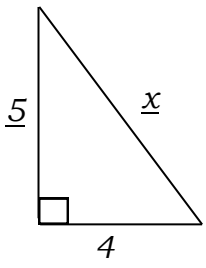

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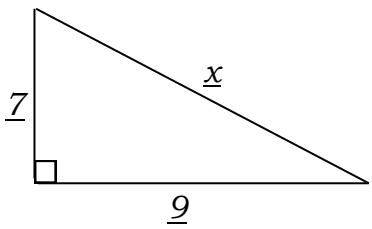

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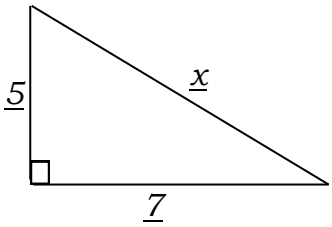

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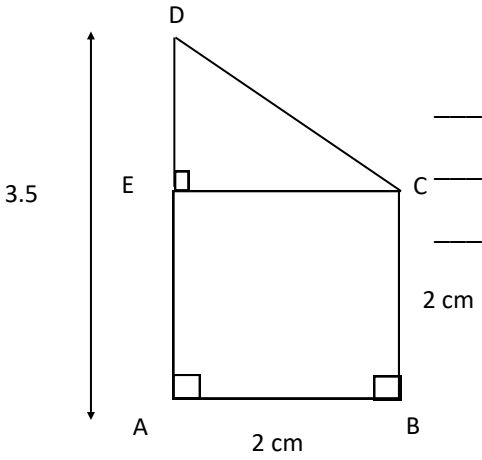
g)



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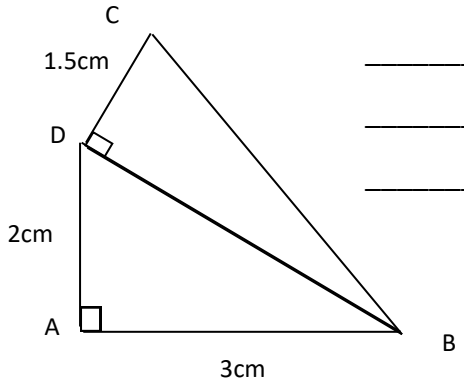
h)



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i) Calculate the diagonal of rectangle with sides 10cm and 11cm.

_____

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_____

j) Calculate the length of a diagonal of a square which has sides 12cm.

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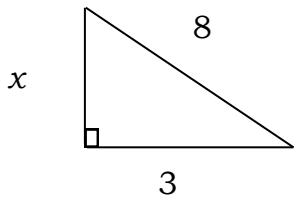
Exercise 14B

Find the missing lengths

Find x in the following diagrams

a)



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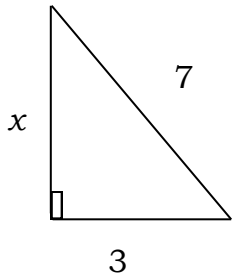
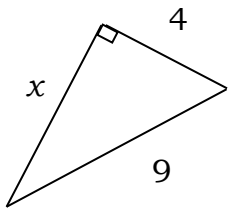
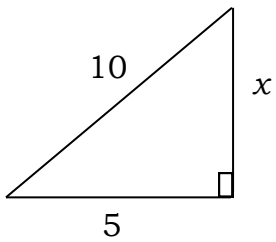


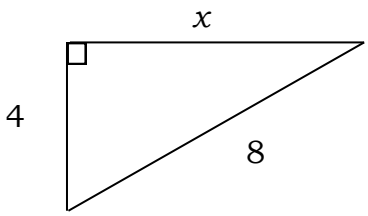
c)



d)

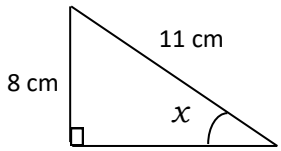


e)

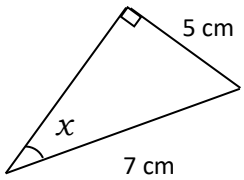


Exercise 15A — **Finding unknown angle (SINE ratio)**

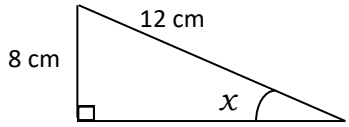
a)



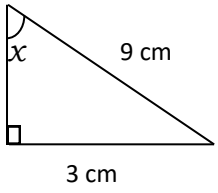
b)



c)



d)



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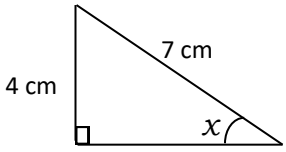
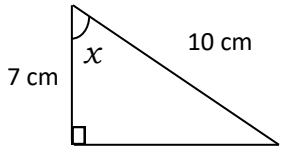


Exercise 15B

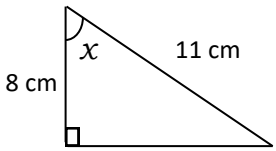
Finding unknown angle (COSINE ratio)

Finding the unknown angle

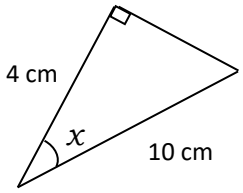
a)



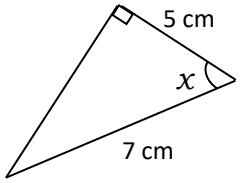
b)



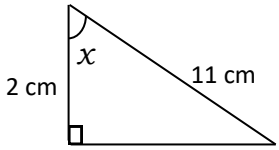
c)



d)



e)

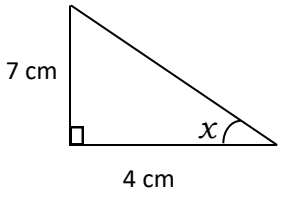


Exercise 15C

Finding unknown angle (TANGENT ratio)

Finding the unknown angle

a)



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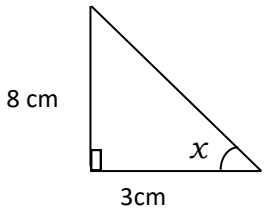
b)



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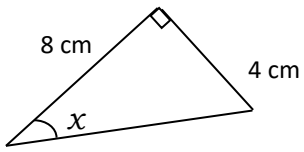
c)



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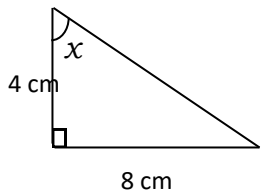
d)



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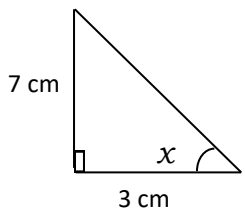
e)



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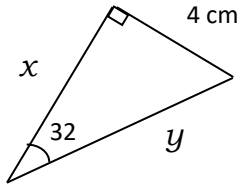
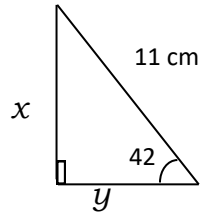
Exercise 15D

Finding the unknown sides

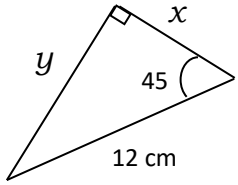
a)



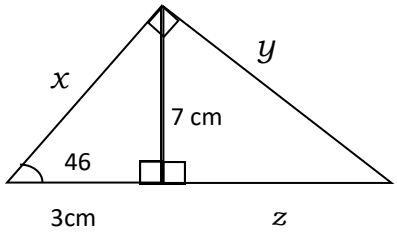
b)



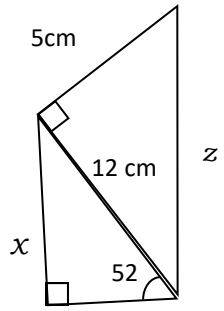
c)



d)

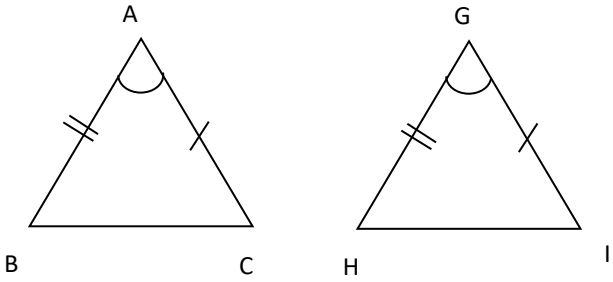


e)



RULES

RULE 1



△ ABC , △ HGI

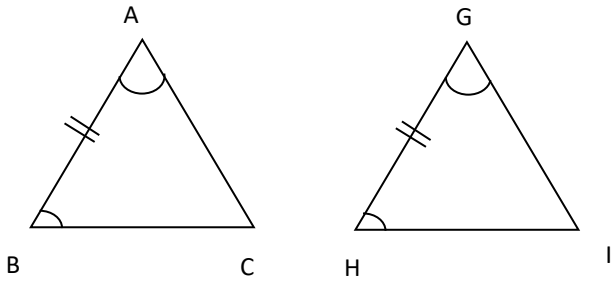
AB = GH

AC = GI

∠A = ∠G

∴ Δ ABC ≡ ΔGHI **(SAS)**

RULE 2



△ ABC , △ HGI

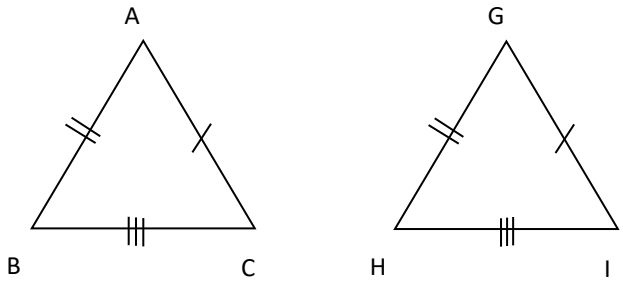
AB = GH

∠A = ∠G

∠B = ∠H

∴ Δ ABC ≡ ΔGHI **(ASA)**

RULE 3



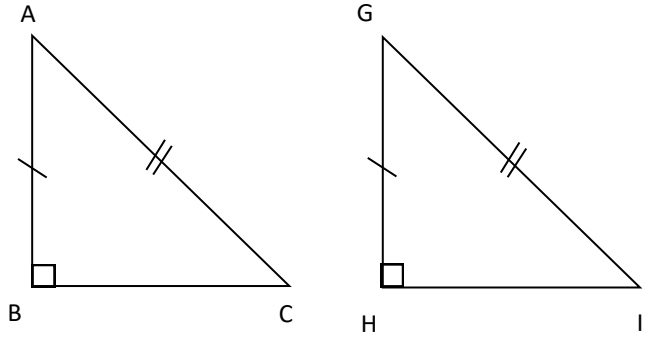
△ ABC , △ HGI

AB = GH

AC = GI

BC = HI **(SSS)**

RULE 4



△ ABC , △ HGI

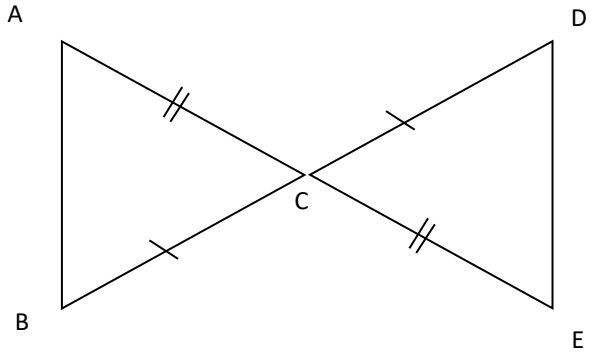
AB = GH

AC = GI

∴ Δ ABC ≡ ΔGHI **(RHS)**

Example:

State if the two triangles are congruent. If they are state the rule .



Δ ABC, ΔGHI

AC = CE **(DATA)**

BC = CD **(DATA)**

A$\hat{C}$B = D$\hat{C}$E **(OPPOSITE)**

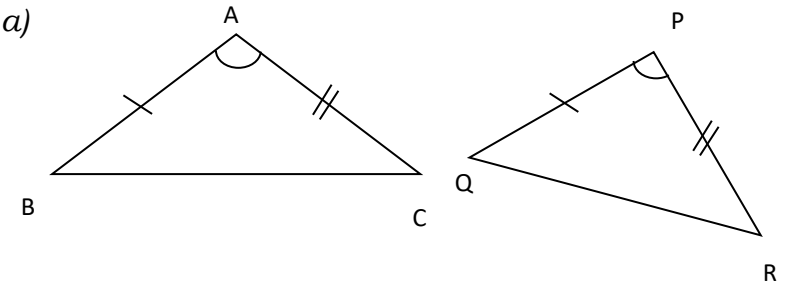
$\therefore \Delta$ ACB $\equiv \Delta$CDE **(SAS)**

Exercise 16A

Congruent triangles

State if the two triangles are congruent. If they are state the rule .

a)



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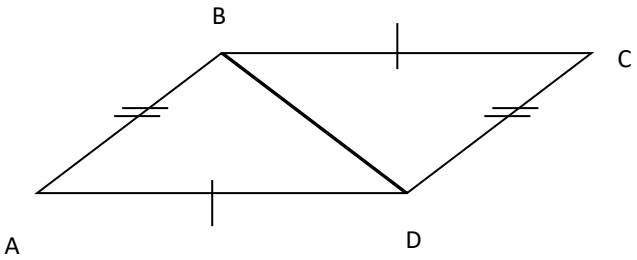
b)



_____

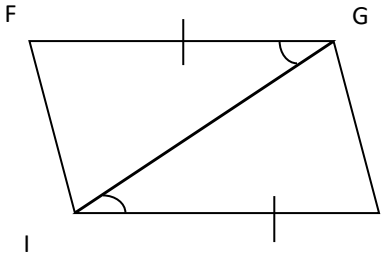
_____

_____

_____

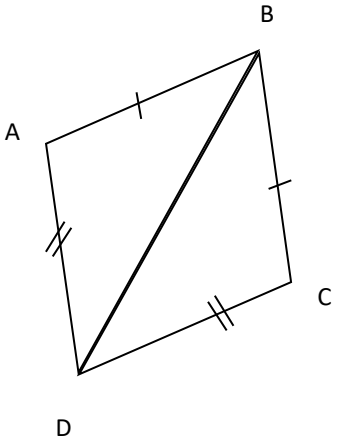
_____

c)

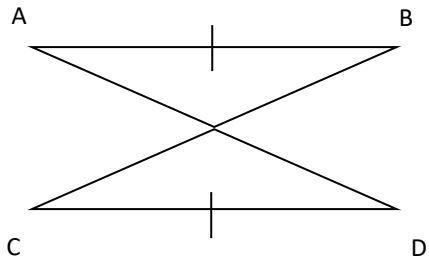


FĜI = GÎH

d)



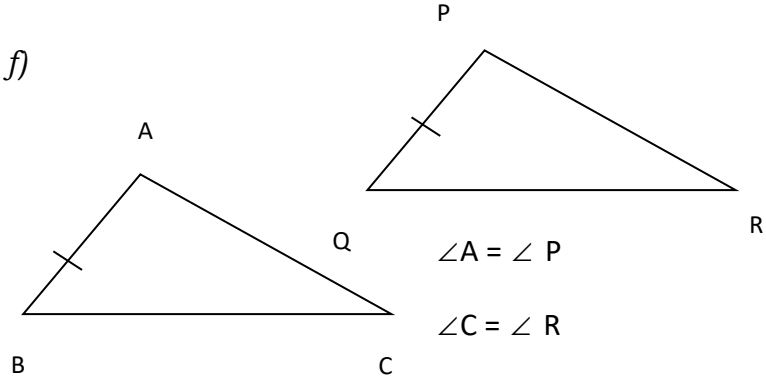
e)



∠A = ∠ D

∠B = ∠ C

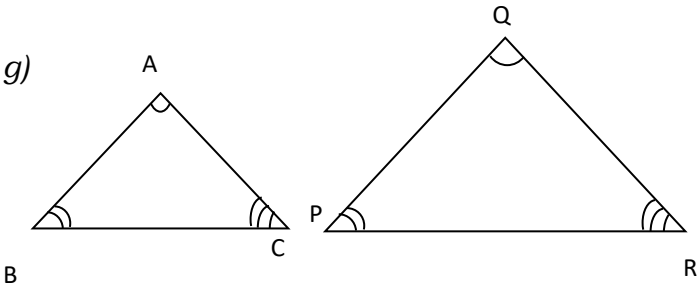
f)



∠A = ∠ P

∠C = ∠ R

g)



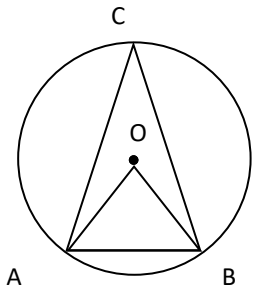
∠ A = ∠ Q , ∠ B = ∠ P, ∠ C = ∠ R

Circle theorems

Chapter 17

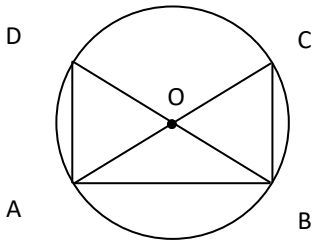
Theorems

Theorem 1



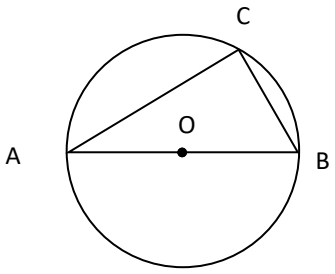
$A\hat{O}B = 2\,A\hat{C}B$

Theorem 2



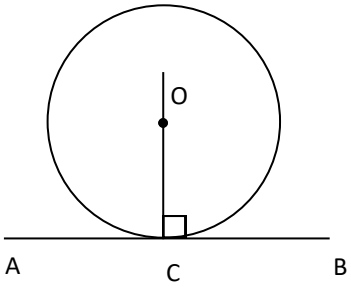
$\angle D = \angle C$

Theorem 3



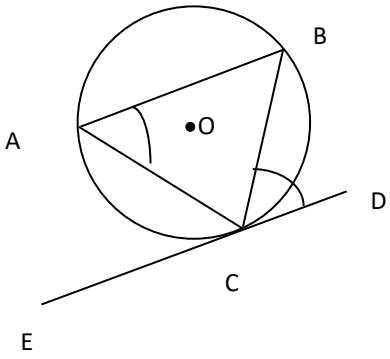
AB is a diameter. $\angle C = 90°$

Theorem 4



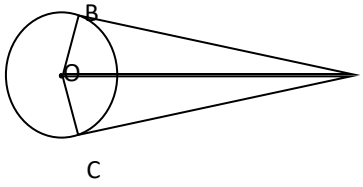
ACB is a tangent so $O\hat{C}B = 90°$.

Theorem 5



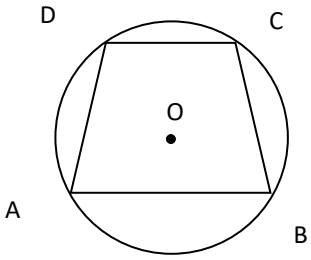
$\angle BCD = \angle BAC$

Theorem 6



AB and AC are tangents from A, so AB = AC and $B\hat{A}O = C\hat{A}O$.

Theorem 7

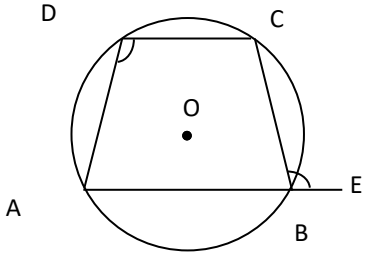


ABCD is a cyclic quadrilateral.

$\angle B + \angle D = 180$

$\angle A + \angle C = 180$

Theorem 8



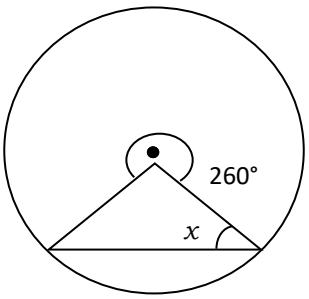
$\angle CBE = \angle ADC$

Exercise 17A

Application of Circle theorems

Find x in the following diagrams.

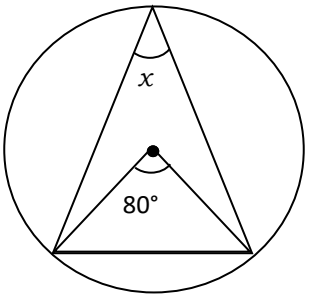
a)



_____

_____

b)



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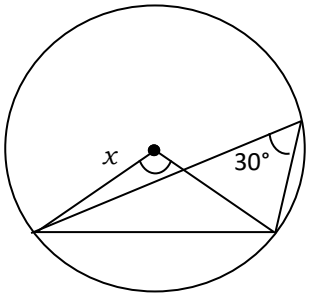
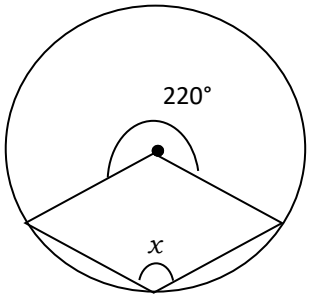
c)



_____

_____

d)



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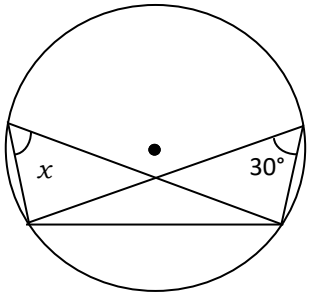
e)



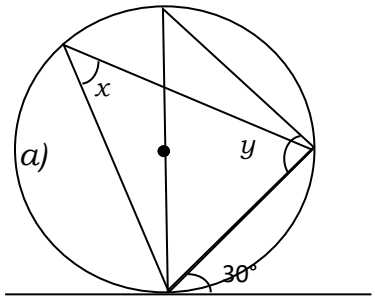
_____

_____

Exercise 17B

More questions on Circle theorems

a)



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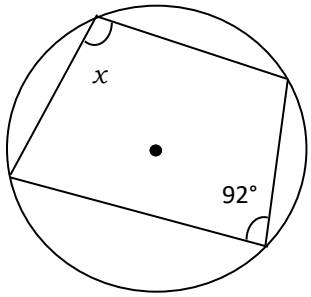
_____

b)



_____

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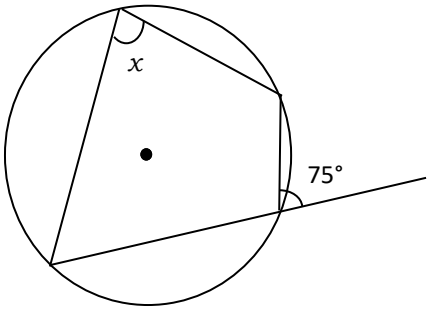
c)



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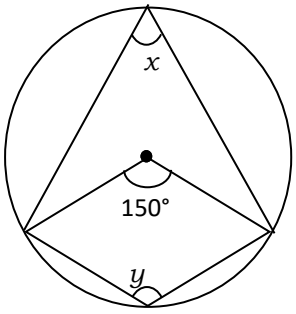
d)



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Similar shapes

Chapter 18

Exercise 18A

Proportional Relationship

You can use proportional relationships to find missing side lengths in similar figures.

Solve each proportion

a) $\frac{2}{5} = \frac{x}{25}$

b) $\frac{1}{8} = \frac{x}{3}$

c) $\frac{3}{x} = \frac{x}{75}$

d) $\frac{2}{7} = \frac{x}{14}$

e) $\frac{1}{x} = \frac{x}{100}$

f) $\frac{7}{5} = \frac{x}{15}$

g) $\frac{2}{x} = \frac{x}{32}$

h) $\frac{6}{8} = \frac{x}{4}$

i) $\frac{8}{x} = \frac{x}{8}$

j) $\frac{3}{6} = \frac{x}{12}$

k) $\frac{3}{x} = \frac{x}{20}$

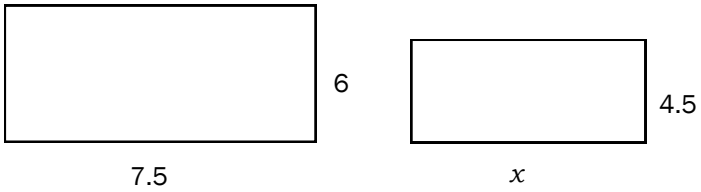
l) $\frac{4}{5} = \frac{x}{20}$

Exercise 18B

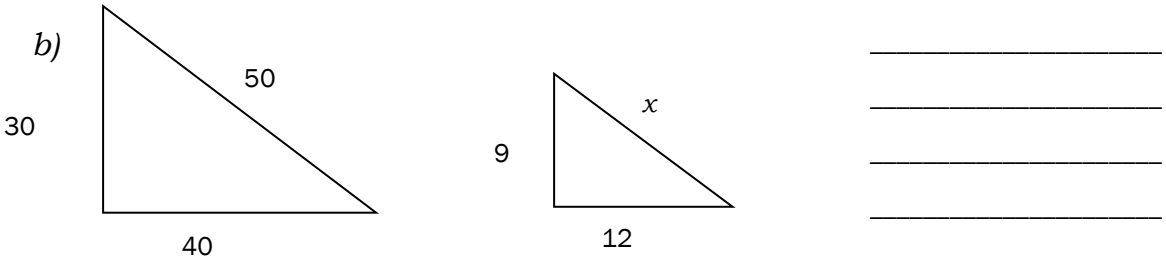
Proportional Relationship

Find the value of x for each pair of similar shapes.

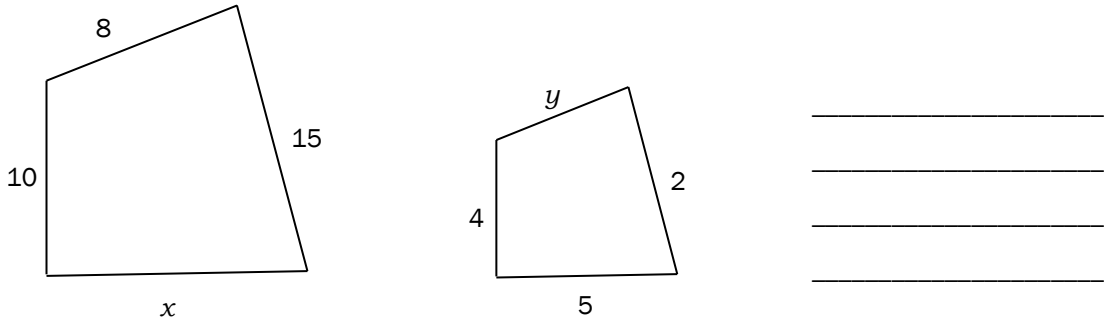
a)



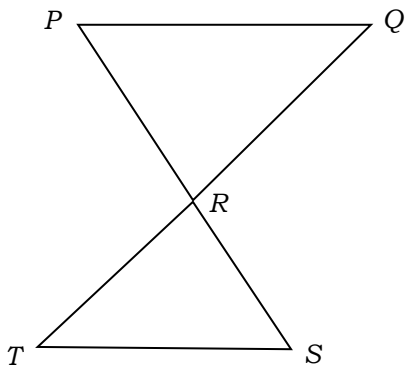
b)



c)



d) In this diagram PQ is parallel to TS, PQ = 20 cm, TS = 12 cm and QR = 15cm. What is the length of TR?



Exercise 19A

Number sequence

Find the next two terms and the n^{th} term for the sequences below.

1.	4	7	10	13	( )	( )	n^{th} term: _____
2.	16	14	12	10	( )	( )	n^{th} term: _____
3.	1	2	4	8	( )	( )	n^{th} term: _____
4.	2	8	14	20	( )	( )	n^{th} term: _____
5.	7	15	23	31	( )	( )	n^{th} term: _____
6.	3	9	27	81	( )	( )	n^{th} term: _____
7.	7.1	14.2	28.4		( )	( )	n^{th} term: _____
8.	1.1	2.2	4.4	8.8	( )	( )	n^{th} term: _____
9.	5	20	80	320	( )	( )	n^{th} term: _____
10.	5	13	21	29	( )	( )	n^{th} term: _____
11.	28	18	8	-2	( )	( )	n^{th} term: _____
12.	729	243	81	27	( )	( )	n^{th} term: _____
13.	0	8	16	24	( )	( )	n^{th} term: _____
14.	-10	-2	6	14	( )	( )	n^{th} term: _____
15.	42	32	22	12	( )	( )	n^{th} term: _____
16.	1	12	23	34	( )	( )	n^{th} term: _____
17.	-7	-2	3	8	( )	( )	n^{th} term: _____
18.	2	12	72	432	( )	( )	n^{th} term: _____
19.	45	9	1.8	0.36	( )	( )	n^{th} term: _____
20.	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	( )	( )	n^{th} term: _____

Real life graph

Chapter 20

Exercise 20A

Real life graph

1) The table below shows the price of potatoes.

Weight (kg)	1	2	3	4	5
Cost (£)	10	12	14	16	18

a) Draw the graph for the table of results. (Use your exercise book)

b) Predict how much 6 kg of potatoes would cost. _____

c) How much would 4.5 kg of potatoes cost? _____

2) The price of lamb sold in a shop is shown in the table below.

Weight (kg)	1	2	3	4	5
Cost (£)	3.50	5.00	6.50	8.00	9.50

a) Draw the graph for the table of results. (use your exercise book)

b) Predict the cost of 6 kg of lamb.

_____

c) How much would 4.5 kg of lamb cost?

_____

3) The table below shows the distance travelled by a car.

Time taken (h)	0	0.5	1	1.5	2	2.5
Distance (km)	0	30	60	90	120	150

a) Draw the graph for the table of results. (use your exercise book)

b) How far did the salesman travel in 1 hours?

_____

c) Predict how for the salesman would travel in 3 hours.

_____

Exercise 21A

Mean and Range

For each set of values find: *a)* mean *b)* the range.

a) 5, 1, 8, 7

b) 8, 2, 7, 8, 10

c) 43, 21, 28,

d) 12, 13, 16, 15

e) 16, 15, 13, 12

f) 7, 8, 5, 10, 5

g) 10, 20, 25, 5, 10

h) 0.8, 0.5, 0.2, 0.9

i) 45, 62, 32, 8, 25, 32

j) 3, 2, 1, 6, 4, 5, 84

_____

k) 20, 19, 20, 18, 14, 3, 6, 14, 18, 2, 20, 22

_____

l) 1.5, 2.5, 4, 3.5, 0.5, 1.2, 1.8, 1.7, 1.3

_____

m) 103, 99, 102, 14

_____

n) 8, 11, 7, 4, 10, 8

_____

o) 4, 7, 3, 3, 12, 13

_____

p) 5, 3, 1, 6, 3, 0, 2, 4

_____

q) 12, 11, 10, 11, 22, 20

_____

r) 17, 3, 2, 18

_____

s) 16, 5, 4, 5, 15

_____

t) 116, 112, 120, 125, 122

_____

Exercise 21B | **Mean, Median, Mode and Range**

Find the mean, median, mode and range.

a) 7, 6, 7, 10, 5, 6, 10, 9, 9, 7, 5, 3, 8, 9, 3, 5, 9, 2, 2, 2, 9

b) 4, 6, 9, 3, 10, 10, 4, 4, 2, 8, 6, 7, 8, 6, 7, 8, 9, 5, 4, 3, 3

c) 4, 5, 9, 8, 8, 5, 4, 8, 5, 3, 9, 5, 6, 7, 3, 4, 6, 6, 3, 5, 6

d) 9, 5, 7, 8, 10, 3, 5, 2, 7, 3, 3, 4, 2, 1, 7, 5, 4, 9

e) 5, 4, 6, 7, 4, 2, 5, 4, 6, 4

f) 8, 7, 8, 9, 6, 7, 9, 10, 10, 8, 6, 4, 9, 10, 4, 6, 10, 3, 3, 3, 9

g) 5, 7, 10, 3, 9, 9, 5, 5, 3, 9, 9, 5, 5, 3, 9, 7, 9, 8, 3, 5, 3, 5, 5

h) 5, 6, 10, 9, 8, 6, 3, 10, 8, 7, 9, 5, 4, 5, 7, 7, 4, 5, 6

Exercise 21C

Calculations using Frequency Table

Complete the frequency table and find the Modal class, Median class and Range

A) 15, 16, 13, 16, 13, 14, 21, 16, 23, 26, 17, 19, 18, 22, 24, 17, 24, 20, 24, 22

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

b) 7, 7, 6, 5, 7, 7, 9, 7, 4, 3, 5, 6, 7, 9, 9, 4, 4, 4, 5, 4

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

c) 9, 7, 9, 8, 8, 6, 9, 6, 6, 7, 9, 5, 3

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

d) 2, 3, 4, 6, 7, 5, 6, 6, 6, 8, 9

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

e) 25, 23, 27, 25, 26, 23, 22, 22

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

f) 13, 14, 15, 16, 13, 14, 27, 23, 22, 25, 17, 19, 18, 22, 26, 17, 24, 20, 28, 29

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

g) 5, 6, 8, 7, 4, 5, 9, 7, 9, 10, 4, 6, 4, 8, 8, 3, 4, 5

Data	tally	Frequency
0 - 5		
6 - 11		
12 - 17		
18 - 23		
23 - 28		
28 - 33		

Modal class: _____

Median class: _____

Range: _____

h) A random selection of 4 students were used as a sample. Based on this, the whole class was surveyed The results are followed.

Calculate the ***a)*** **mean** ***b)*** **median** ***c)*** **mode and** ***d)*** **range** of the data.

Weight	Frequency
42	5
60	4
65	2
70	4

i) "How many years of no claims bonus do you have?"

The above question was asked at people in a shopping mall.

Calculate the ***a)*** **mean** ***b)*** **median** ***c)*** **mode and** ***d)*** **range** of the data.

Years	Frequency
0	10
1	5
2	20
3	30
4	10

j) Peter had 30 boxes of matches. He counted the number of matches in each box. The table gives information about his results.

a) Write down the modal number of matches in a box.

b) Work out the range of the number of matches in a box.

c) Work out the mean number of matches in a box.

Matches	Frequency
29	8
30	12
31	5
32	5

Probability

Chapter 22

Exercise 22A

Basic probability

Q1 Find the probability for the following question.

a) A bag contains 6 red balls, 4 blue balls and 2 white balls. If a ball is drawn at random, find the probability that it is:

1) white …….. 2) red …….. 3) blue ……..

4) not white…….. 5) yellow ……..

6) either blue or yellow ……..

b) A die is thrown once. Find the probability that it shows:

1) a four …….. 2) a six ……..

3) an even number …… 4) a number less than 5 ……..

c) From the letters of the word CORRESPONDENCE , one letter is selected at random. What is the probability that the letter is:

1) a vowel …….. 2) a consonant ……

3) the letter 'E' ……. 4) the letter R and O ……

d) The numbers 1 to 10 are wrotten on separate cards. One card is chosen at random. What is the probability that the number is:

1) 0dd ……. 2) even …….. 3) 8 ……..

4) divisible by 5 …… 5) a prime number ……..

e) A card is drawn at random from a normal pack of 52 cards. Find the probability that the card is:

1) a spde …….. 2) a red 10 …….. 3) a queen ……

4) not a diamond …….. 5) a jack or king ……

f) A bag holds 9 blue, 6 red and 3 yellow sweets. A sweet is randomly selected from the bag. What si the probability, as a fraction in simplest form, that sweet is:

1) blue …….. 2) red or blue ……

3) green …….. 4) red, yellow or blue ……..

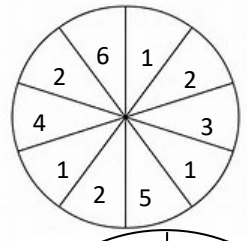
Q2 Answer the following questions

a) If a die is rolled 64 times, how many times would you expect to get:

1) a 3 …….. 2) an even number ……..

3) a number less than 4 ……

b) If this spinner is spun 100 times, how many times would you expect to spin:

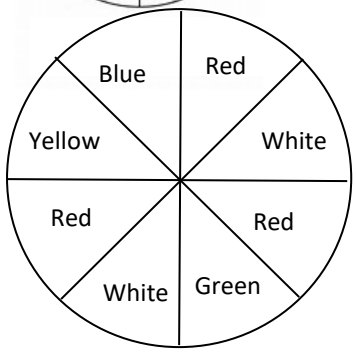


1) 5 ? …… 2) 2? ……..

3) an odd number? …… 4) 3? ……

5) 1?..... 6) 2 & 4 ……

c) This spinner was spun 40 times. the number of times each colour was spun is shown in the table.



Colour	Red	White	Blue	Green	Yellow
frequency	14	9	8	5	4

1) Which colour was spun the same number of times as you expect?

……

……

2) Which colours were spun more times than you would expect?

……

……

d) Mathi threw a die 100 times and recorded the results. she calculated that the relative frequency of the result 5 was 0.23. “That is a lot higher than I would have thought” she said. Du you agree? Briefly comment, justifying your answer.

……

……

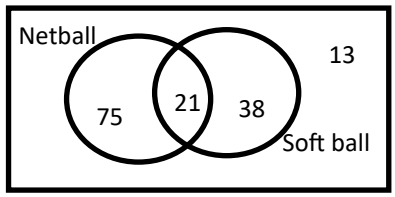
……

……

Exercise 22C

Venn diagrams

Q1 The Venn diagram shows the sports played by some students.



a) How many students:

i) were there altogether ? ……

ii) played net ball but not soft ball? ……..

iii) played soft ball? ……..

b) What is the probability that a randomly chosen student from the group plays?

i) both netball and softball? ……

ii) softball but not netball? ……

iii) neither netball nor softball ? ……..

Q2 In a class of 40 students who study either maths or English or both. 19 study maths and 21 study English.

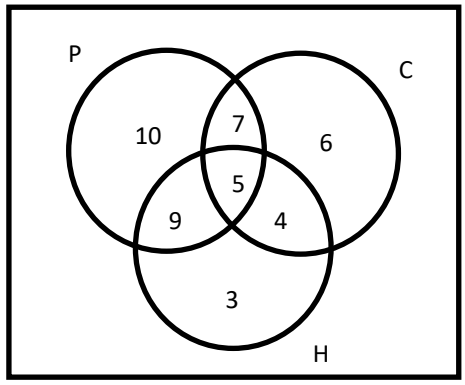
a) Draw a Venn diagram to represent this.

b) How many study both languages? ……

c) If a student is randomly chosen from the class, what is the probability that she studies only French?

……

Q3 A group of students were asked if they had studied the following subjects: *Physics, Chemistry, History* . The results are shown in the Venn diagram. What is the probability that a randomly chosen student from the group has studied:



a) all three books ? ……..

b) only physics ? ……..

c) none of the books? ……

d) Chemistry ? ……..

e) exactly 2 of the books? ……

Exercise 22D

Two way tables

Q1 A survey was taken at a set of traffic lights. cars were observed to see whether the driver was male or female and whether they were carrying passengers. the results are shown in the two - way table.

	Passengers	No Passengers
Male driver	58	99
Female driver	32	91

a) How many drivers were male? ……

b) How many cars were carrying passengers?.....

c) How many cars were counted altogether? ……

d) What fraction of cars carrying passengers had a female driver? …….

Q2 Peter conducted a survey of 75 men and 125 women to see whether they agreed or disagreed with a particular advertisement. He drew up this table.

	Agreed	Disagreed	Total
Male	15	60	75
Female	35	90	125
Total	50	150	200

a) What percentage of those who agreed were female? ……

b) What percentage of females agreed? ……..

c) If a person is selected at random from the surveyed group, what is the probability that he or she:

i) agreed with the advertisement? ……

ii) is a female? ……..

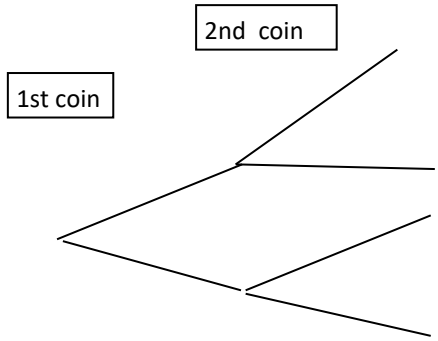
iii) is a female who agreed with the advert……..

Exercise 22E

Tree diagram

Q1 Two coins are tossed at the same time.

a) Complete the tree diagram and list the sample space.



Use the tree diagram to find the probability of :

b) two tails …….

c) one tail and one head in any order……..

d) at least one head ……..

e) exactly two heads ……..

Q2 Four cards marked with the numbers 1, 2, 3 and 4 are placed in a box. Two cards are selected at random, one after the other without replacement, to form a two digit number.

a) Draw a tree diagram to show the possible outcomes:

b) How many different two - digit numbers can be formed ……..

c) What is the probability that the number formed is :

i) less than 34 ……. ii) divisible by 3 ……..

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NO	NAME	STATUS	AUTHOR
1	Verbal reasoning (Orange)	Published	M.Nat
2	Non verbal Reasoning (Apple)	Published	M.Nat
3	Easy Going Verbal reasoning B1	Published	M.Nat
4	Easy Going Non Verbal reasoning	Published	M.Nat
5	Easy Going Mathematics Book 1	Published	M.Nat
6	Easy Going Mathematics Book 2	Published	M.Nat
7	Easy Going Mathematics Book 3	Published	M.Nat
8	Easy Going Mathematics Book 4	Published	M.Nat
9	Easy Going Mathematics Book 5	Published	M.Nat
10	Easy Going Mathematics Year 3	Published	M.Nat
11	Easy Going English Year 3 Book 1 & 2	Published	J. Suki
12	Easy Going Mathematics Year 4	Published	M.Nat
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