Easy Going

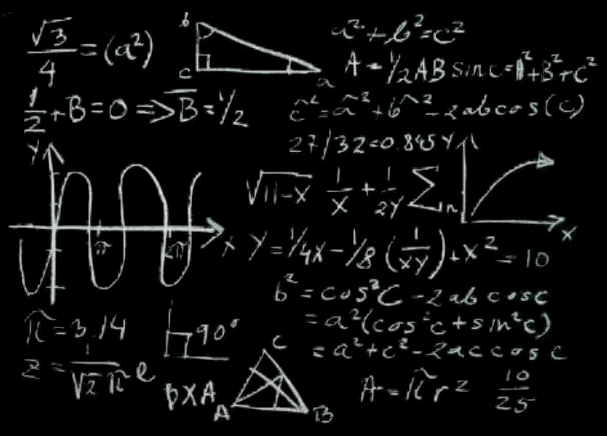
MATHEMATICS

Work Book

YEAR 9

The complete National Curriculum

Many practice exercises.



BOOK 2

M.Nat

Practice Makes Perfect

Success at your fingertips

Acknowledgements

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I express my gratitude towards Nijeja , Sharugi who have provided their valuable time to proof read and design this book . Last but not least I express my gratitude towards my students for their inspiration and progressive feedback which has only led me to improve every maths book of mine..

M.Nat

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M.Nat BSc, BEd, P.G.C.E Diploma in computer programming, Diploma in supervisory Management

Year 9

Workbook

Book 2

More than 500 questions included

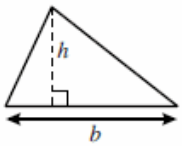
Mr M. Nat

CONTENT PAGE

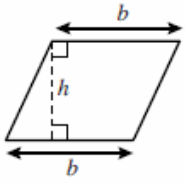
Book 3 (coming very soon)

1. Factorising difference of two squares
2. Quadratic factors.
3. Solving quadratic equations.
4. trans formation
5. Handling data 2
6. Inequalities
7. Graphs
8. Loci

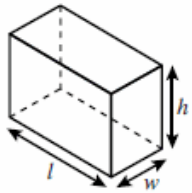
FORMULA SHEET



$A = \frac{1}{2}bh$



$A = bh$

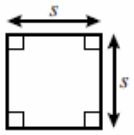


$V = lwh$

$S.A. = 2lw + 2lh + 2wh$

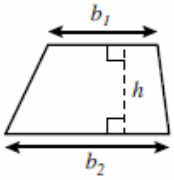
$V = \frac{1}{3}\pi r^2 h$

$S.A. = \pi rl + \pi r^2$

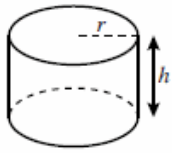


$p = 4s$

$A = s^2$

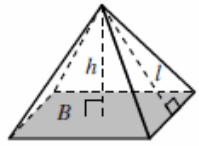


$A = \frac{1}{2}h(b_1 + b_2)$



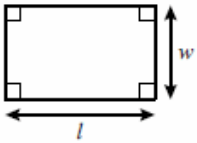
$V = \pi r^2 h$

$S.A. = 2\pi rh + 2\pi r^2$



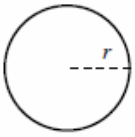
$V = \frac{1}{3}Bh$

$S.A. = \frac{1}{2}lp + B$



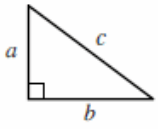
$p = 2l + 2w$

$A = lw$

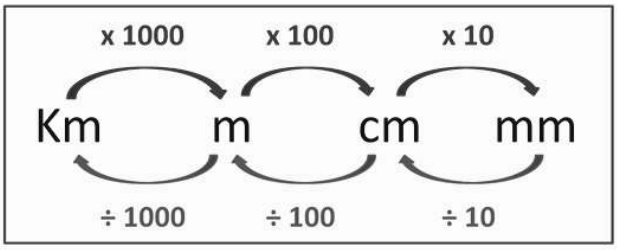


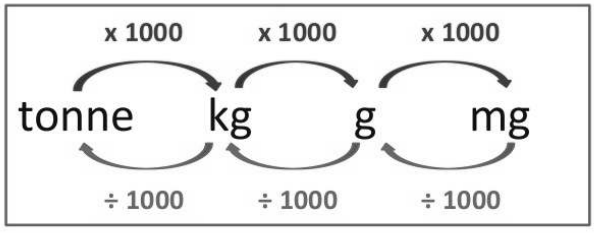
$C = 2\pi r$

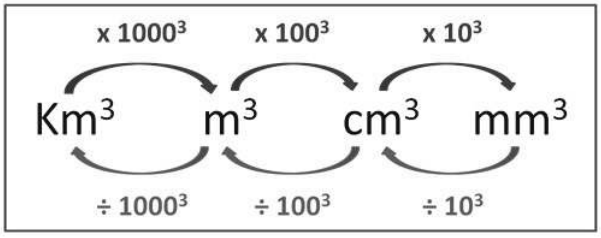
$A = \pi r^2$



$c^2 = a^2 + b^2$







Algebraic Equations

Chapter 1

Exercise 1A

Elimination Method

Q1 Solve the simultaneous equation by using the elimination method, which can be done by adding or subtractions.

a) $6x + 4y = 40$
$2x - 4y = 8$

b) $3x + 2y = 14$
$5x - 2y = 18$

c) $5x - 4y = 6$
$2x - 4y = 0$

d) $10x - y = -2$
$10x - 4y = 7$

e) $a + 3b = 4$
$a + b = 3$

f) $5x - 3y = 12$
$4x + 3y = 15$

g) $6p + 5q = -1$
$6p + 2q = 5$

h) $2x + 4y = 18$
$2x + 7y = 21$

i) $p - 6q = -18$
$3p - 6q = -24$

j) $5p - 3q = 19$
$4p + 3q = -1$

Q2 Solve these simultaneous equation by multiplying both sides of one or both of the equations.

a) $3p - 2q = -19$
$2p + 4q = 6$

b) $x - 2y = 7$
$2x + y = 4$

c) $2p - q = 4$
$p - 3q = 7$

d) $7x - y = 20$
$4x - 2y = 10$

e) $3x + 5y = 7$

$5x - 2y = -9$

f) $4p + 3q = 11$

$3p + 2q = 9$

g) $3p + 10q = 22$

$2p - 5q = 3$

h) $3a - 2b = 2.5$

$2b + 4a = -13$

i) $2p + q = 0$

$p - q = 3$

j) $p - q = -2$

$q - 2p = -1$

Exercise 1B

Substitution Method

Q1 Solve these simultaneous equations by using substitution method.

a) $y = x - 1$
$3x + 2y = 8$

b) $y = 2x - 1$
$7x + 2y = 20$

c) $y = x + 1$
$2y + 3x = 7$

d) $x = y - 1$
$2x + y = 7$

e) $x = 2y - 1$
$3x + 4y = 17$

f) $y = 3x - 1$
$3y + x = 7$

g) $y = 5x - 7$
$4y + 3x = 18$

h) $q = 6p - 2$
$p = 3q - 2.5$

i) $x = y - 2$
$2x + 3y = 21$

j) $a = 2b + 1$
$3a - 4b = 7$

Exercise 1C

Using Simultaneous equations

Q1 By reading each questions carefully, answer the following simultaneous equations.

a) Find a pair of numbers satisfying $9p - 2q = 68$ such that one number is four times the other.

b) The difference between two numbers x and y is 21 ($x - y = 21$).

i) The two numbers x and y add to 95. Write an equation for this.

ii) Solve the simultaneous equation to find the two numbers.

c) The ages of a young couple add up to 54. If the husband is 2 years older than his wife, how old is the wife, include both your equations.

_____

_____

_____

_____

d) Sarvan's age is double the age of Rani. Both of their age total is 12. Write the simultane ous equation and find their ages.

_____

_____

_____

_____

e) The weight of a red parcel is 1kg more than the weight of the yellow parcel. Three times the weight of the red parcel added with two times the weight of the yellow parcel is 8. Write the simultaneous equation and find the weight of the red and yellow parcels.

_____

_____

_____

_____

Exercise 2A

Basic probability

Q1 From the letters of the word DISCUSSION, one letter is selected at random. What is the probability that the letter is:

a) a consonant _____

b) a vowel _____

c) the letter S _____

d) the letter O _____

e) the letter I _____

f) the letter C or N _____

Q2 A card is drawn at random from a normal pack of 52 cards. Find the probability that the card is:

a) a spade _____

b) red _____

c) a jack or king _____

d) not a heart _____

e) black _____

Q3 A bag holds 7 blue balls, 6 white balls and 2 black balls. A ball is randomly selected from the bag. What is the probability as a fraction in the simplest term, if the ball is:

a) black _____

b) blue _____

c) white _____

d) green _____

e) blue or black _____

Q4 A die is thrown once. Find the probability that it shows:

a) a five _____

b) a seven _____

c) four or higher _____

d) an even number _____

e) a prime number _____

f) a prime and square number _____

Q5 The numbers from 1 to 10 are written on separate cards. One card is chosen at random. What is the probability that the number is:

a) odd number _____

b) even number _____

c) prime number _____

d) square number _____

e) divisible by 5 _____

f) zero _____

Exercise 2B

Relative frequency

The following formula shows the relative frequency of an event from experimental results.

Relative frequency = $\frac{\text{number of times an event occurs}}{\text{number of trials}}$

Q1 Write the relative frequency of the **score 4, as a fraction,** in the following number sets.

a) 7, 4, 4, 3, 5, 1 _____

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

c) 3, 4, 6, 4, 4, 6, 7, 3 _____

d) 7, 9, 8, 9, 7, 9, 4, 4 _____

e) 7, 7, 4, 7, 3, 5, 7 _____

f) 1, 8, 8, 6, 8, 4, 4, 3, 8 _____

g) 6, 8, 10, 12, 4, 4, 10, 4, 11 _____

h) 7, 5, 6, 1, 4, 3, 2, 1, 4, 5, 4 _____

i) 3, 4, 8, 7, 4, 4, 7, 9, 8 _____

j) 2, 4, 4, 4, 5, 6, 7, 4, 10 _____

k) 3, 4, 4, 4, 5, 7, 8, 9 _____

l) 3, 4, 4, 4, 4, 6, 7, 8, 9 _____

m) 1, 2, 3, 5, 4, 10, 11, 12 _____

n) 10, 12, 13, 14, 5, 14, 4 _____

o) 17, 18, 19, 4, 18, 4, 18, 9 _____

Q2 Complete the relative frequency column for the following tables. Give your answer to the correct two decimal places.

a)

Data	Frequency	Relative frequency
1	3	
2	2	
3	4	
4	5	
5	3	
6	8	

b)

Data	Frequency	Relative frequency
2	1	
5	5	
8	7	
11	6	
14	1	
17	3	

c)

Data	Frequency	Relative frequency
2	1	
4	5	
6	4	
8	3	
10	2	
12	6	

d)

Data	Frequency	Relative frequency
5	3	
7	2	
8	4	
9	5	
10	6	
12	7	

e)

Data	Frequency	Relative frequency
4	1	
5	3	
6	5	
7	4	
8	2	
9	6	

f)

Data	Frequency	Relative frequency
5	1	
10	2	
15	3	
20	4	
25	5	
30	6	

Q1

Answer the following questions, which are based on single events probability.

a) If a die is rolled 50 times, how many times, would you expect to get:

i) a 3 _____

ii) an even number _____

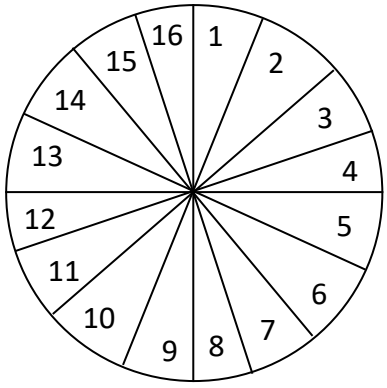
iii) a prime number _____

iv) a 5 _____

v) a 1 _____

vi) a odd number _____

b) If this spinner is spun 70 times, how many times would you get:



i) a 10 _____

ii) an even number _____

iii) a 8 _____

iv) a 13 _____

v) a prime number _____

vi) an odd number _____

vii) a number less than 9 _____

c) A bag contains 5 red balls, 3 yellow balls and 2 green balls. One ball is taken out at random. What is the probability that the ball is:

i) red _____

ii) yellow _____

iii) green _____

d) One card is selected at random from the following cards: Ace of club, Queen of club, 5 of club, Ace of heart, King of heart, 9 of diamond, 5 of diamond and 2 of diamond. Find the probability of selecting:

i) a diamond _____

ii) a club _____

iii) a 10 of club _____

iv) a spade _____

v) a club or a diamond _____

e) i) A bag contains 3 red balls, 5 yellow balls and 1 blue ball.
Find the probability of picking a

a) a blue ball _____

b) a yellow ball _____

ii) One red ball is removed from the bag.
Find the new probability of selecting:

a) a blue ball _____

b) a red ball _____

Q2 Answer the following questions, which are based on two events probability.

a) Two coins are tossed.

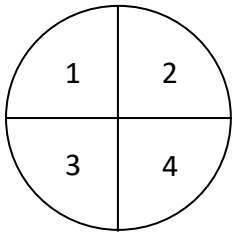
i) Draw a grid to show all the possible outcomes.

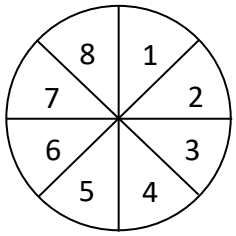
ii) Find the probability of getting two heads. _____

iii) Find the probability of getting two tails. _____

iv) Find the probability of getting one head and one tail. _____

b) Peter spins these two spinners together.





i) Draw a grid to show all the possible outcomes.

ii) Find the probability of obtaining:

a) total of 6 _____

b) the same number on the spinners _____

c) Sharon throws a yellow die and a white die at the same time.

i) Draw a grid to show all the possible outcomes.

ii) Find the probability that Sharon obtains:

a) a total of 8 _____

b) a total of 7 _____

c) a total less than 10 _____

d) the same number on both dice. _____

d) A coin is tossed and a dice is rolled. Find the probability of getting:

i) a head and a 4 _____

ii) a tail and number less than 5 _____

iii) a tail and a prime number _____

iv) a head and a square number _____

v) a tail and a number greater than 3 _____

e) A six sided spinner is spun twice. The numbers are added.

i) Draw a grid for possible outcomes.

ii) Find the probability the total will be:

a) 8 _____

b) 12 _____

c) an odd number _____

d) a prime number _____

e) a number less than 8 _____

Exercise 2d — Tree diagram

Q1 Answer the following questions, which are based on more than two events probability. Use tree diagram to answer the questions.

a) A bag contains 4 blue balls and 2 white balls. A ball is drawn at random and then replaced. Another ball is drawn at random.

i) Draw a tree diagram.

ii) Find the probability of picking :

a) two blue balls _____

b) two white balls _____

c) one white ball and one blue ball _____

b) A bag contains 6 red balls and 4 blue balls. A ball is selected and is not replaced.

Another ball is selected.

i) Draw a tree diagram.

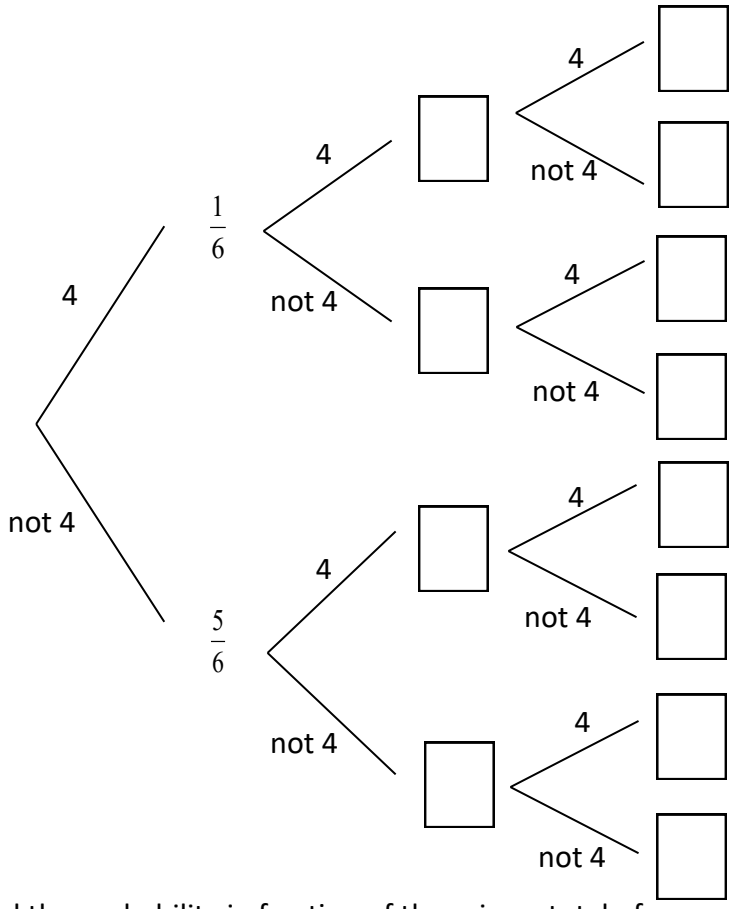
ii) Find the probability that:

a) two red balls will be picked _____

b) both balls will be blue _____

c) A six sided die is thrown three times.

i) Complete the tree diagram, which shows the probability for number 4.



ii) Find the probability in fraction of throwing a total of

a) three fours _____

b) no fours _____

c) one four _____

d) at least one four _____

d) When you crop a rose, the probability that they growing is $\frac{3}{5}$. Two crops are taken.

i) What is the probability that

a) both crops grow _____

b) neither of them grows _____

e) There are 8 boys and 10 girls in a class. Two students are chosen at random.

What is the probability that:

i) both are girls _____

ii) both are boys _____

iii) one is a boy and one is a girl _____

f) There are 10 boys and 7 girls in a class. Three students are chosen at random.

Giving your answers in fractions, calculate the probability if:

i) all three are boys _____

ii) all three are girls _____

iii) two boys and one girl _____

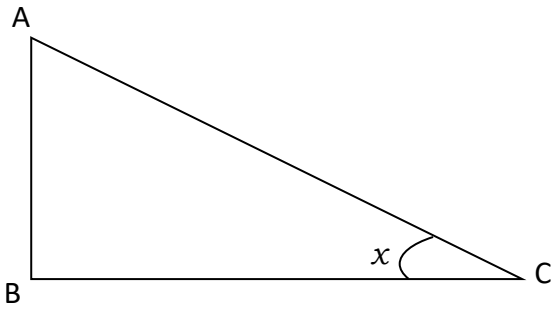
iv) two girls and one boy _____

Trigonometry

Chapter 3

Exercise 3A

Trigonometric Ratios



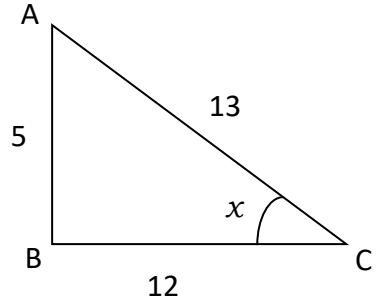
$\sin x = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{AB}{AC}$

$\cos x = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{BC}{AC}$

$\tan x = \frac{\text{opposite}}{\text{adjacent}} = \frac{AB}{BC}$

Q1 Write the trigonometric ratios for the following triangles.

a)

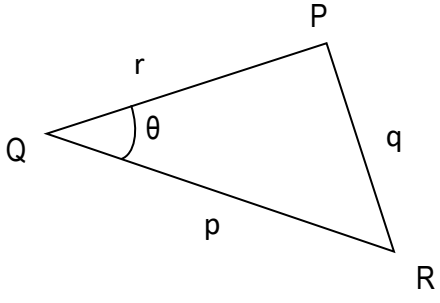


i) sin x _____

ii) cos x _____

iii) tan x _____

b)

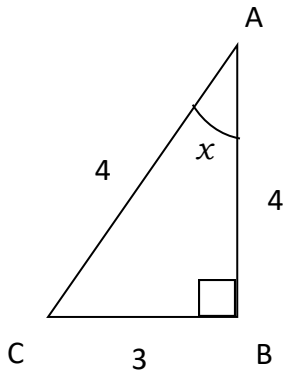


i) sin θ _____

ii) cos θ _____

iii) tan θ _____

c)

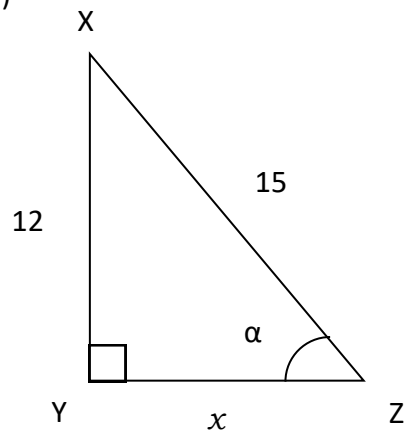


i) sin x _____

ii) cos x _____

iii) tan x _____

d)

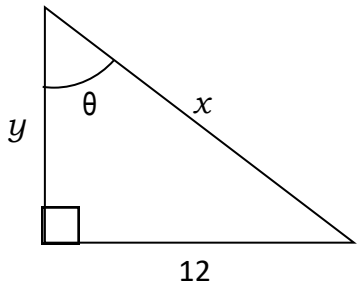


i) sin α _____

ii) cos α _____

iii) tan α _____

e)

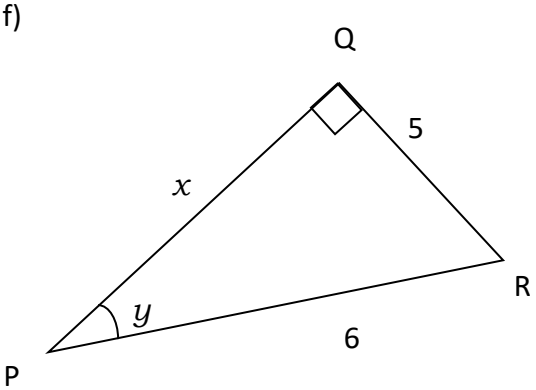


i) sin θ _____

ii) cos θ _____

iii) tan θ _____

f)

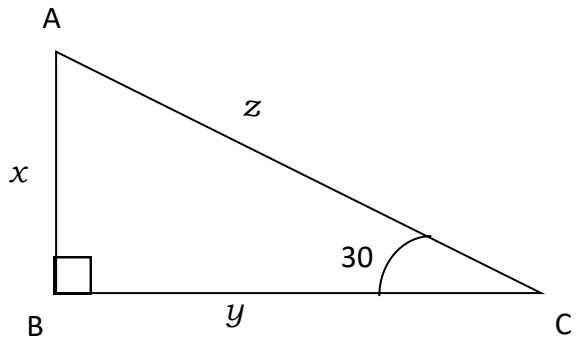


i) sin y _____

ii) cos y _____

iii) tan y _____

g)

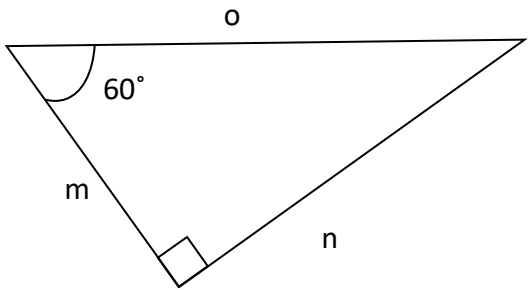


i) sin 30˚ _____

ii) cos 30˚ _____

iii) tan 30˚ _____

h)

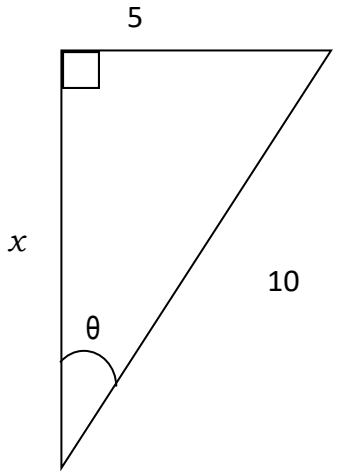


i) sin 60˚ _____

ii) cos 60˚ _____

iii) tan 60˚ _____

i)

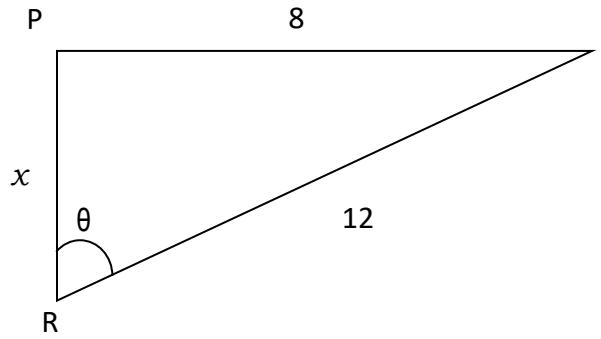


i) sin θ _____

ii) cos θ _____

iii) tan θ _____

j)



i) sin θ _____

ii) cos θ _____

iii) tan θ _____

Q2 Using a calculator, find the value of the following questions to the correct 3 decimal points.

a) sin 65 _____ b) sin 86 _____

c) cos 85 _____ d) tan 95 _____

e) sin 46 _____ f) cos 46 _____

g) tan 46 _____ h) sin 126 _____

i) sin 98 _____ j) cos 126 _____

k) tan 125 _____ l) sin 25 _____

m) cos 23 _____ n) tan 27 _____

Q3 Find the size of the acute angle to the nearest degree.

a) $\sin \theta = 0.5352$

_____

_____

b) $\cos A = 0.7879$

_____

_____

c) $\sin \theta = 0.6566$

_____

_____

d) $\tan A = 1.5356$

_____

_____

e) $\sin \theta = \frac{2}{3}$

_____

_____

f) $\sin \theta = \frac{5}{6}$

_____

_____

g) $\tan A = \frac{16}{28}$

_____

_____

h) $\cos \theta = \frac{7}{8}$

_____

_____

i) $\sin A = \frac{7.6}{13.4}$

_____

_____

j) $\cos A = \frac{\mathbf{1}}{\mathbf{6}}$

_____

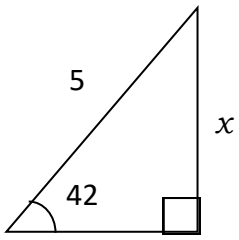
_____

Exercise 3B

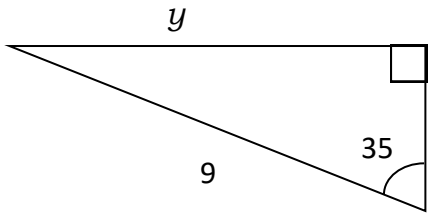
Finding the length

Q1 Find the length of the missing side using the sine ratio and give your answer to 1 decimal point.

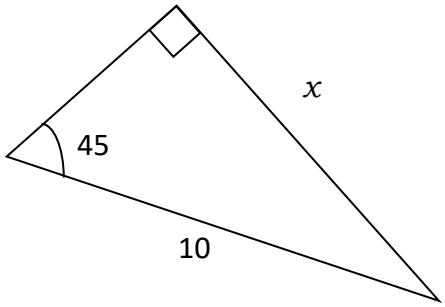
a)



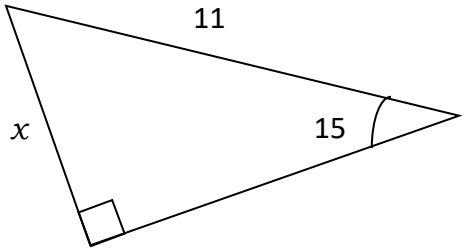
b)



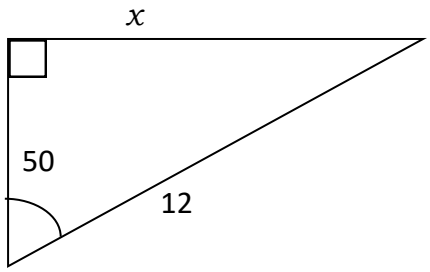
c)



d)

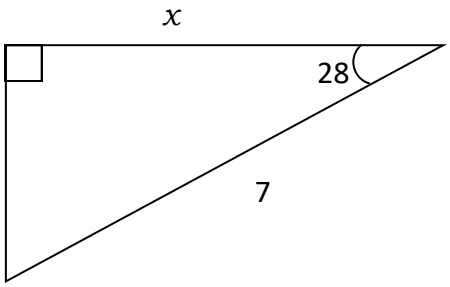


e)

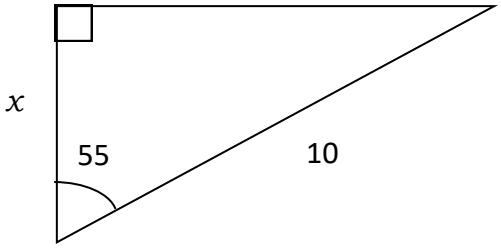


Q2 Find the length of the missing side using the cosine ratio and give your answer to 1 decimal point.

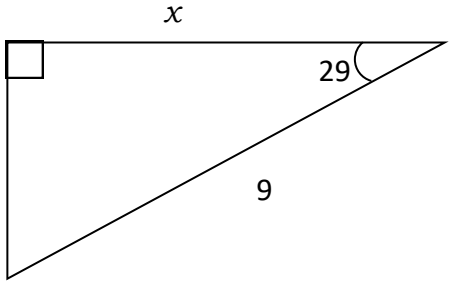
a)



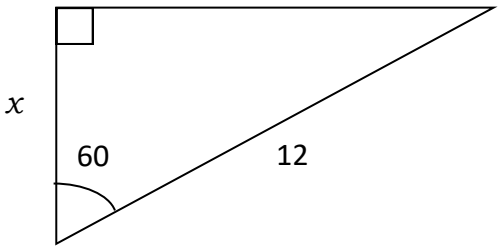
b)



c)



d)



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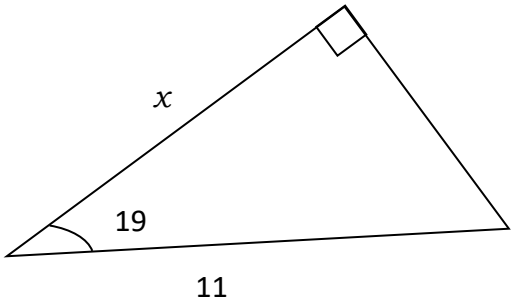
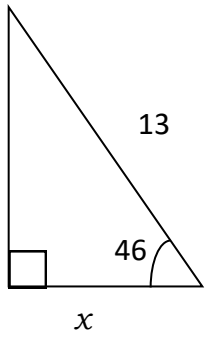
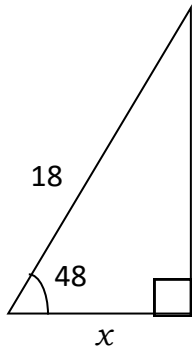


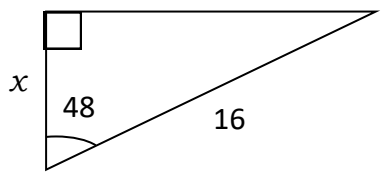
f)



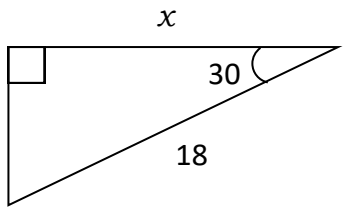
g)



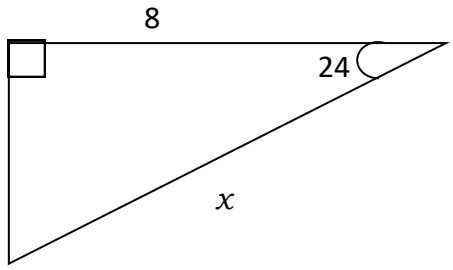
h)



i)

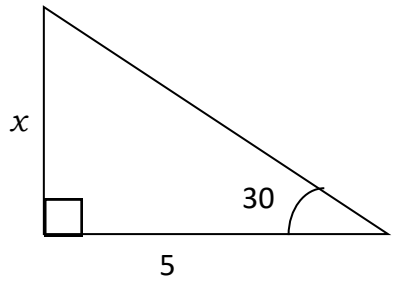


j)

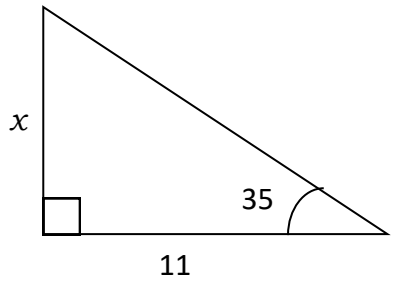


Q3 Find the length of the missing side using the tangent ratio and give your answer to 1 decimal point.

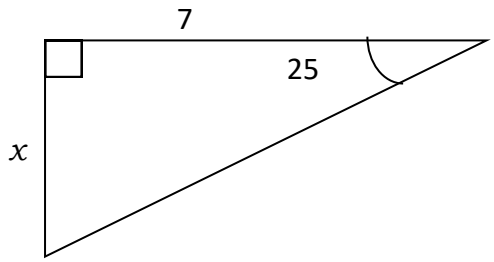
a)



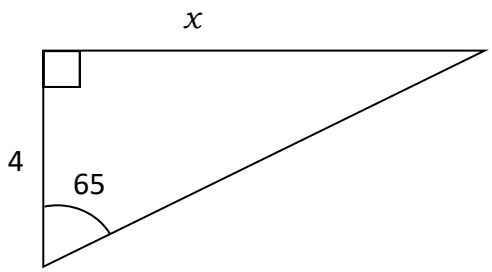
b)



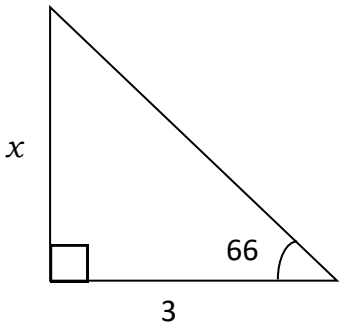
c)



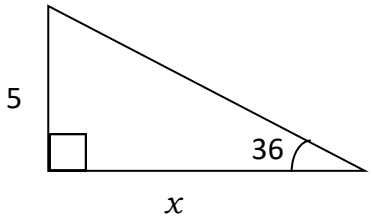
d)



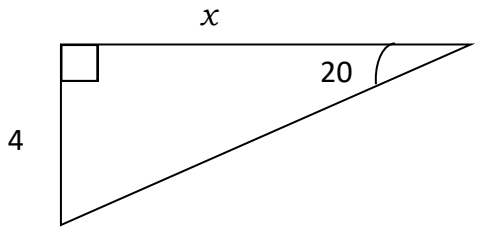
e)



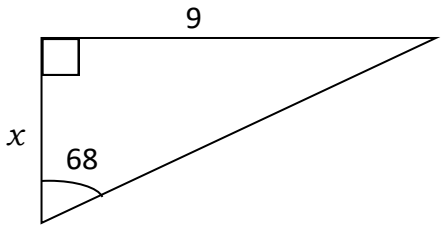
f)



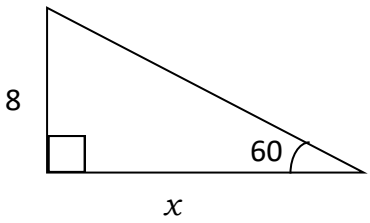
g)



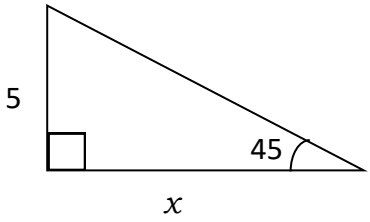
h)



i)

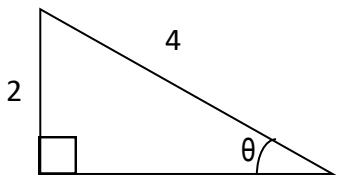


j)

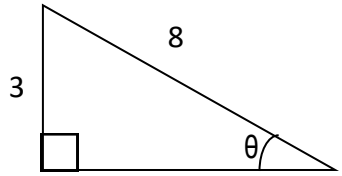


Q1 Find θ in the following triangles by using the sine ratio. Give your answer to the nearest degree.

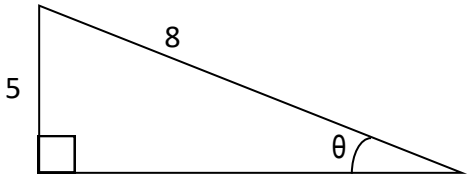
a)



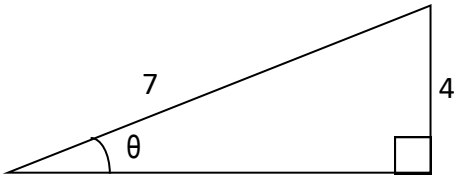
b)



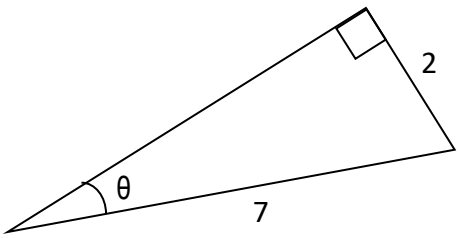
c)



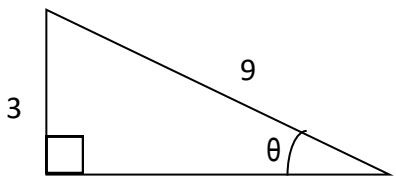
d)



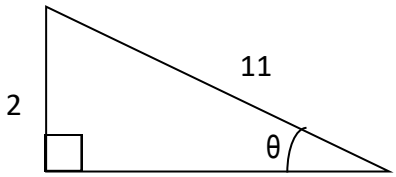
e)



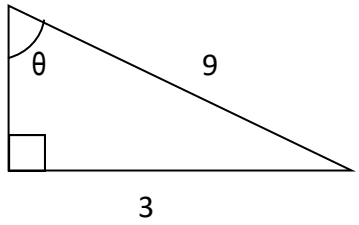
f)



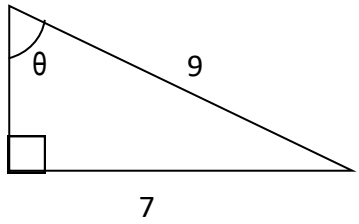
g)



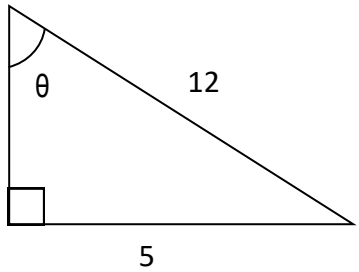
h)



i)

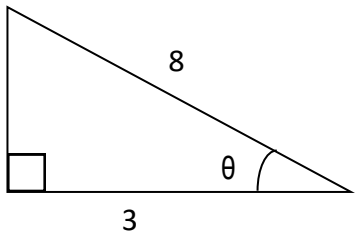


j)

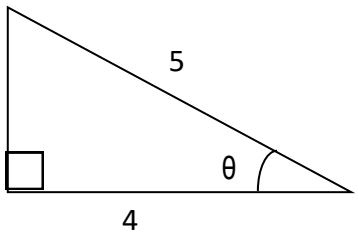


Q2 Find θ in the following triangles by using the cosine ratio. Give your answer to the nearest degree.

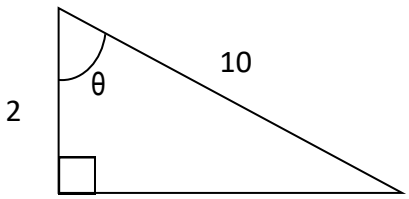
a)



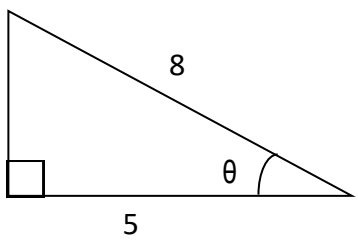
b)



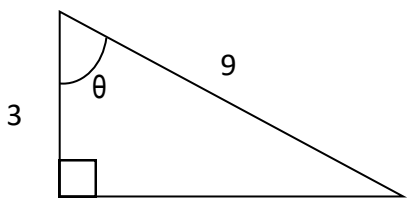
c)



d)



e)



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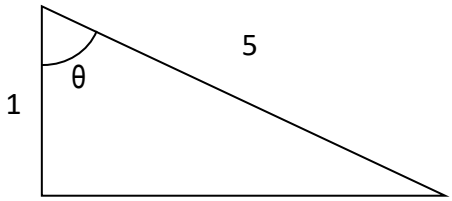
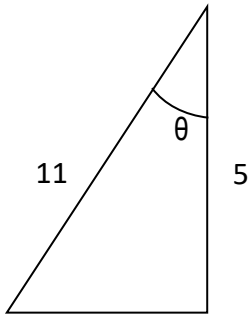
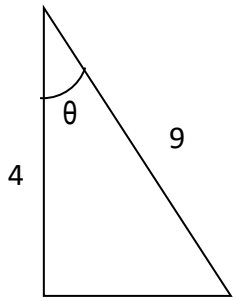


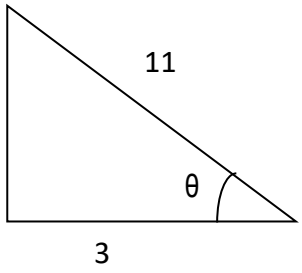
g)



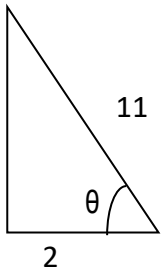
h)



i)

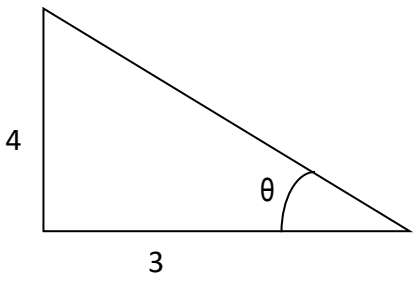


j)

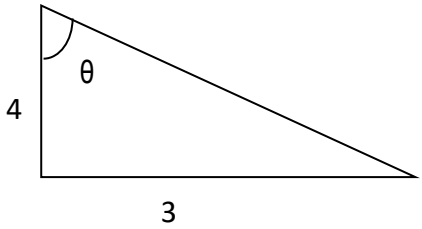


Q3 Find θ in the following triangles by using the tangent ratio. Give your answer to the nearest degree.

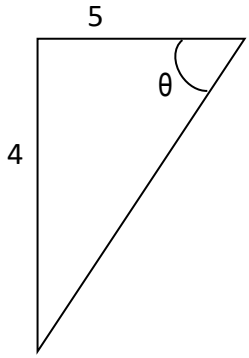
a)



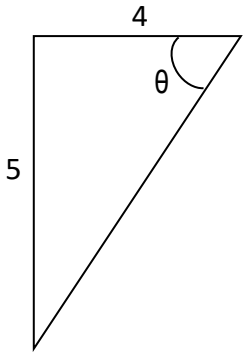
b)



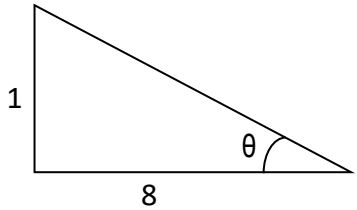
c)



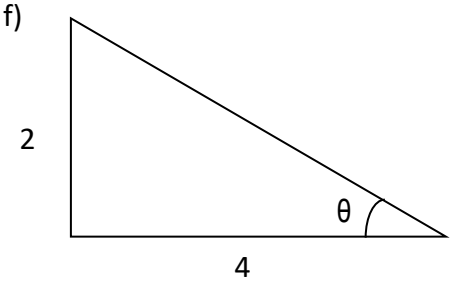
d)



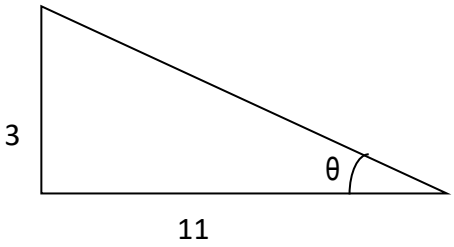
e)



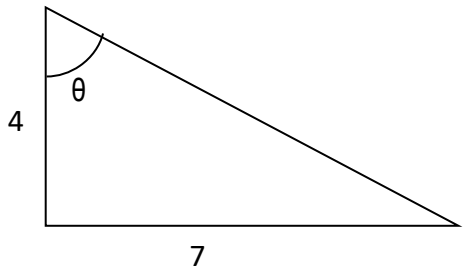
f)



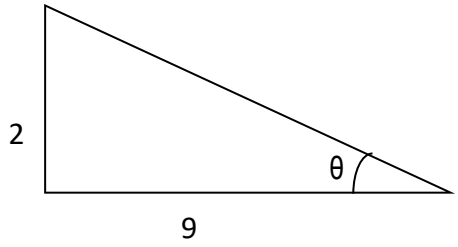
g)



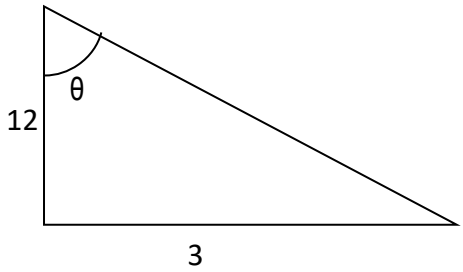
h)



i)



j)

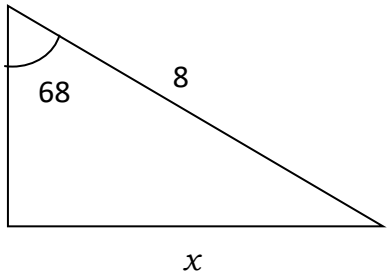


Exercise 3D

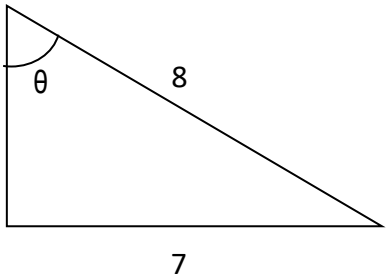
Mixed Questions

Q1 Using one of the trigonometric ratios, find the missing value.Give your answer to three s.f

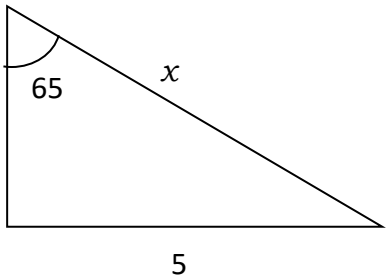
a)



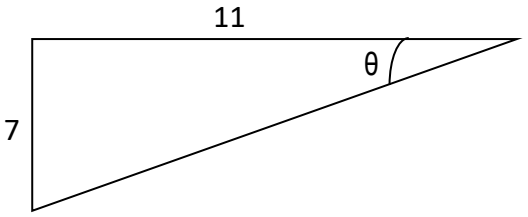
b)



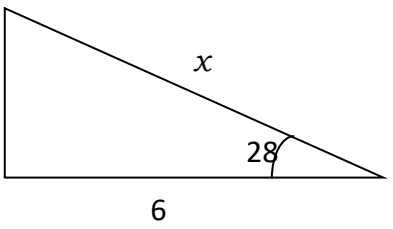
c)



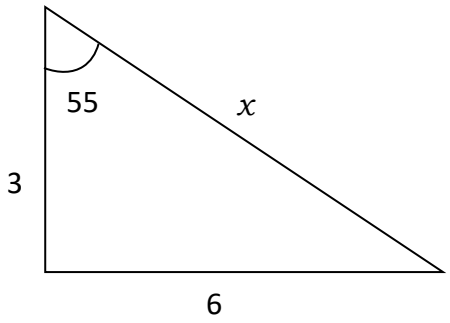
d)



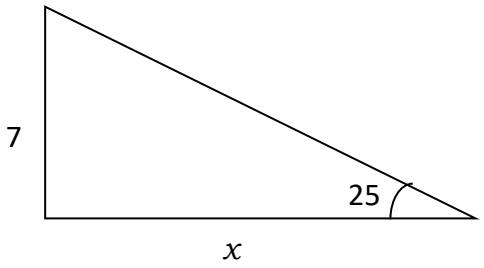
e)



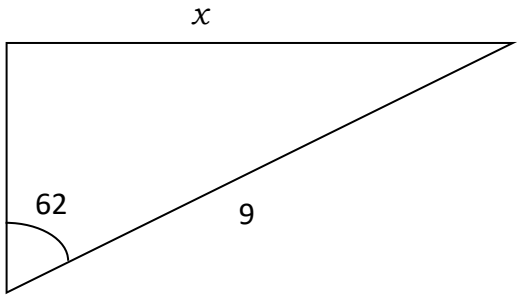
f)



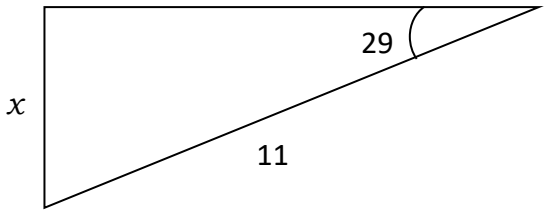
g)



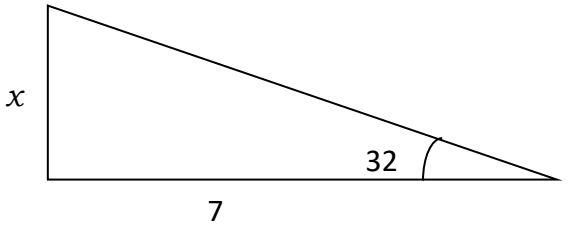
h)



i)



j)



Q2 Answer the following questions, giving your answer to 1 decimal point.

a) In triangle ABC, $\hat{C} = 90^{\circ}$, $\hat{B} = 32.3^{\circ}$ and AC = 4.7cm. Find the length of AB.

_____

_____

_____

b) Find the diagonal length of a rectangle if the length is 11.4cm and the angle between the diagonal length and longest side is 30°.

_____

_____

_____

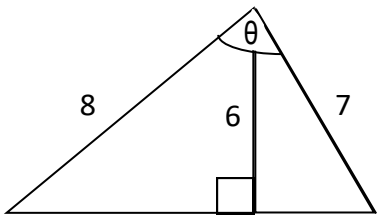
c) A ladder that is 5m in length, rests against a vertical wall so that the base of the ladder is 2.5m from the wall. Calculate the angle between the ladder and the ground.

_____

_____

_____

d)



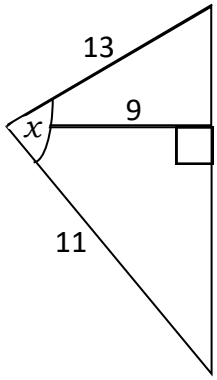
Find the value of θ

_____

_____

_____

e)



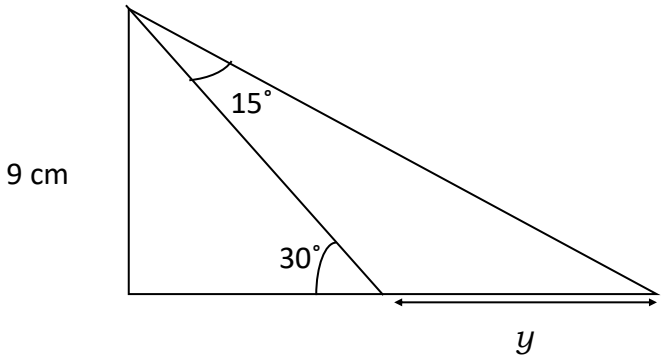
Find the value x

_____

_____

_____

f)



Calculate the length of y

_____

_____

_____

g) An isosceles triangle has sides of length 12cm, 12cm, 6cm. Find the angle between the two equal sides?

_____

_____

_____

Handling data 1

Chapter 4

Exercise 4A — Discrete and Continuous Data

Discrete Data - Data with whole numbers.

Continuous Data - Data with decimals and whole numbers.

Q1 State whether the data is discrete or continuous data.

a) The weight of a man _____

b) Shoe size _____

c) The heights of building _____

d) The age of pupils in the class _____

e) Maximum temperatures recorded _____

f) Number od people in the library _____

g) The number of women in the library _____

h) The amount of children walk to school _____

i) The number of milkshakes sold in a sold _____

j) The distance of different motorways in the country _____

Exercise 4B — Mean

$$\text{Mean} = \frac{\text{Total}}{\text{Number of elements}}$$

Q1 Find the mean of each of the following sets of numbers.

a) 8, 7, 6 _____

b) 10, 15, 13, 15 _____

c) 11, 12, 14, 15 _____

d) 11, 15, 19, 13 _____

e) 10, 12, 15, 17 _____

f) 18, 19, 22, 23, 25, 31 _____

g) 14, 18, 12, 10, 9 _____

h) 20, 21, 22, 23 _____

i) 18, 19, 17, 20 _____

j) 7, 10, 8, 9, 11 _____

Q2 Find the mean of each of the following sets of numbers.

a) 4, 4, 6, 6, 6, 5, 5, 5, 5, 5 _____

b) 12, 12, 13, 13, 13, 12, 12, 12, 12, 12 _____

c) 13, 13, 16, 16, 16, 17, 17, 17, 17, 17 _____

d) 7, 7, 7, 7 ,7, 8, 8, 9, 9, 10 _____

e) 9, 10, 11, 12, 11, 10, 9, 8 _____

f) 17, 16, 18, 15, 14, 14, 15, 17, 16, 16 _____

g) 10, 10, 10, 10, 9, 12, 10, 8, 7, 7 _____

h) 4, 4, 4, 5, 5, 5, 8, 8, 9, 9, _____

i) 11, 11, 11, 13, 13, 14, 14, 14, 14, 14 _____

j) 9, 9, 9, 9, 8, 9, 7, 7, 9, 3 _____

Q3 Complete the frequency table and determine the mean. Give your answer to 2dp

a)

x	f	fx
1	2	
2	3	
3	4	
4	5	
5	6	

Mean : _____

b)

x	f	fx
1	7	
2	9	
3	3	
4	5	
5	6	

Mean : _____

c)

x	f	fx
5	1	
10	3	
15	2	
20	4	
25	2	
30	5	

Mean : _____

d)

x	f	fx
5	2	
10	5	
15	6	
20	4	
25	3	
30	7	

Mean : _____

e)

x	f	fx
7	2	
8	1	
9	3	
10	4	
11	5	
12	3	
13	4	

Mean : _____

Exercise 4C

Mode

Mode = most occurring number in the data

Q1 Find the mode of each of the following sets of numbers.

a) 4, 4, 5, 10, 11, 5, 4, 7, 4, 5 _____

b) 9, 10, 8, 9, 11, 9, 6, 7, 9, 8, 9 _____

c) 6, 7, 8, 7, 7, 6, 6, 7, 7, 7, 5 _____

d) 10, 8, 9, 8, 10, 10, 11, 10, 12, 10 _____

e) 8, 9, 10, 11, 12, 11, 7, 11, 8 _____

f) 5, 8, 6, 8, 6, 8, 5, 4, 8, 8, 8, 9 _____

g) 7, 8, 10, 7, 6, 7, 8, 7 _____

h) 9, 10, 7, 7, 7, 7, 3, 4, 5 _____

i) 3, 4, 5, 4, 4, 6, 7, 4 _____

j) 7, 8, 8, 8, 2, 2, 3, 2, 2, 4, 2, 7 _____

Q2 Find the mode of each of the following sets of numbers.

a) 10, 9, 11, 9, 12, 10, 9, 11, 9 _____

b) 9, 8, 9, 10, 7, 6, 9, 9, 5, 9 _____

c) 7, 8, 6, 8, 9, 7, 9, 9, 7, 6, 9, 9, 10 _____

d) 12, 11, 12, 15, 12, 13, 12, 12 _____

e) 9, 8, 11, 9, 8, 9, 8, 9, 9, 9, 10, 9, 9 _____

f) 9, 10, 9, 7, 9, 7, 9, 9, 7, 9, 9 _____

g) 10, 5, 6, 10, 8, 10, 8, 8, 10, 7, 6, 10, 10, 5, 10 _____

h) 38, 33, 34, 38, 39, 38, 38, 40, 38 _____

i) 28, 26, 26, 29, 26, 30, 31, 33, 26 _____

j) 41, 42, 43, 43, 42, 45, 43, 45, 38, 43 _____

Q3 Find the mode of each of the following sets of numbers.

a) 8, 9, 9, 8, 10, 8, 11, 8, 8, 10 _____

b) 7, 8, 9, 8, 7, 6, 6, 8, 8, 9, 8 _____

c) 4, 5, 6, 6, 7, 6, 7, 6, 8,67, 6, 6, 6, 5, 6 _____

d) 9, 10, 9, 9, 11, 9, 10, 9, 9, 9 _____

e) 6, 5, 8, 8, 5, 8, 7, 8, 9, 8, 8 _____

f) 8, 9, 10, 8, 11, 8, 9, 8, 9, 8, 9, 8, 8 _____

g) 6, 7, 8, 8, 6, 6, 6, 7, 6, 10 _____

h) 8, 7, 10, 10, 7, 10, 9, 10, 11, 10, 10 _____

i) 6, 7, 8, 6, 9, 6, 7, 6, 8, 6, 8, 6, 4, 6 _____

j) 6, 7, 8, 6, 9, 6, 7, 6, 8, 6, 8, 6, 4, 6 _____

k) 6, 7, 8, 7, 6, 5, 6, 6, 6, 7, 8 _____

Exercise 4D — Median

Median = A middle number of an ascending data.

Q1 By the ordering the numbers calculate the median.

a) 5, 6, 7, 9, 7 _____ _____

b) 2, 3, 4, 5, 6, 7 _____ _____

c) 8, 5, 9, 8, 9, 10, 9 _____ _____

d) 9, 13, 15, 11, 10 _____ _____

e) 4, 2, 5, 7, 3, 6 _____ _____

f) 19, 21, 18, 16, 16 _____ _____

g) 21, 23, 20, 18, 18 _____ _____

h) 7, 5, 8, 10, 6, 12 _____ _____

i) 8, 9, 10, 12, 10 _____ _____

j) 5, 6, 7, 8, 9, 10 _____ _____

a) 6, 7, 8, 10, 8 _____ _____

b) 16, 19, 23, 16, 18, 17, 16 _____ _____

Q2 Determine the median of each of the sets of scores by ordering the data.

c) 6, 9, 10, 9, 10, 11, 10 _____ _____

d) 8, 12, 12, 10, 9 _____ _____

e) 7, 3, 10, 8, 6, 9 _____ _____

f) 16, 14, 18, 15, 13, 13 _____ _____

g) 4, 5, 6, 8, 6 _____ _____

h) 14, 17, 21, 14, 16, 15, 14 _____ _____

i) 4, 7, 8, 7, 8, 10, 8 _____ _____

6, 10, 12, 8, 7 _____ _____

Q3 Determine the median of the following numbers.

a) 9, 10, 11, 12, 13 _____

b) 46, 56, 36, 26, 56, 76, 66 _____

c) 11, 13, 6, 10, 7, 12, 8, 9, 13 _____

d) 8, 11, 6, 3, 2, 8, 7, 5, 4, 11 _____

e) 4, 9, 2, 7, 10, 7 _____

f) 9, 8, 7, 9, 6, 14, 10, 10, 4 _____

g) 5, 13, 4, 8, 11, 8, 6, 9, 10, 11, 11 _____

h) 10, 14, 18, 17, 15, 14 _____

i) 8, 7, 6, 8, 5, 13, 11, 11, 5 _____

j) 8, 10, 12, 13, 15, 5, 11 _____

Range = Highest Value - Lowest value

Q1 Determine the range of each of the sets of data.

a) 10, 4, 3, 6, 7, 9, 2

_____ _____

b) 1, 6, 9, 3, 7, 0, 1, 6, 14

_____ _____

c) 6, 9, 4, 5, 3, 14

_____ _____

d) 8, 7, 9, 12, 1, 2

_____ _____

e) 9, 10, 13, 14, 6, 15

_____ _____

f) 12, 13, 14, 25, 20, 21

_____ _____

g) 21, 23, 20, 28, 25, 24

_____ _____

h) 18, 17, 16, 10, 19, 20, 14

_____ _____

i) 27, 28, 29, 16, 15, 10, 30

_____ _____

j) 11, 8, 13, 23, 2, 24

_____ _____

k) 23, 25, 16, 45, 34, 46

_____ _____

Q2 Calculate the range of each of the sets of data.

a) 15, 27, 28, 29, 50, 1, 18

_____

b) 2, 7, 0, 4, 8, 21, 30, 63

_____

c) 7, 13, 6, 4, 12, 17, 31, 53

_____

d) 7, 24, 30, 28, 38, 37, 42

_____

e) 5, 3, 10, 19, 10, 66, 33

_____

f) 19, 7, 14, 11, 13, 9, 8, 31, 48

_____

g) 9, 13, 14, 9, 19, 33, 65

_____

h) 9, 14, 12, 34, 28

_____

i) 6, 4, 11, 20, 11, 67, 34

_____

j) 11, 27, 34, 33, 42, 35, 38

_____

k) 0, 23, 12, 16, 34, 45, 12, 37, 78, 43

_____

l) 15, 23, 67, 45, 10, 38, 59, 78

_____

Exercise 4F

Frequency table

Q1 Draw the frequency table for the following data groups. (Hint: Use the groups as 4 - 8, 9 - 13, 14 - 18, 19 - 23 and so on)

a) 4, 5, 6, 7, 8, 9, 5, 5, 4, 6

7, 13, 14, 15, 15, 15, 6, 16

10, 11, 12, 6, 10, 10, 7, 9

10, 5, 6, 12

Data	Tally	frequency

b) 5, 6, 7, 9, 10, 6, 6, 5, 7, 8

14, 15, 16, 16, 6, 5, 17, 20, 7, 8

7, 17, 20, 16, 15, 9, 7, 21, 21, 10

Data	Tally	frequency

c) 6,10, 15, 22, 25, 31, 6,6, 10, 15

15, 15, 22, 22, 23, 6, 10, 10, 25, 25

31, 31, 10, 6, 15, 22, 25, 31, 31, 6

Data	Tally	frequency

d) 7, 11, 16, 23, 26, 32, 11, 11, 16, 11
23, 23, 23, 7, 7, 11, 7, 26, 32, 7
32, 32, 16, 11, 7, 26, 32, 23, 23,
32,

Data	Tally	frequency

e) 8, 12, 17, 24, 27, 33, 8, 8, 12, 17
17, 8, 8, 24, 24, 27, 12, 27, 33, 33,
8, 12, 24, 27, 33, 24, 24, 24, 14, 12

Data	Tally	frequency

Exercise 4G

Stem and leaf diagram

Q1 Draw the Stem and leaf diagram for the following data groups.

a) 10, 10, 15, 16, 10, 16, 28, 28, 29, 20, 20
15, 15, 20, 26, 15, 10, 38, 30, 30, 36, 38
45, 46, 40, 40, 40, 55, 56, 50, 51, 52, 50
65, 66, 60, 60, 60

KEY:

b) 11, 14, 17, 20, 23, 26, 26, 11, 11, 14, 31,
34, 31, 31, 34, 47, 47, 40, 40, 43, 43, 46,
56, 59, 59, 52, 52, 54, 51, 64, 61, 61, 61,
67, 60, 66, 66, 66

KEY:

c) 25, 28, 21, 24, 27, 30, 33, 33, 33, 25, 25,
35, 35, 38, 41, 44, 44, 47, 45, 40, 50, 50,
58, 53, 54, 57, 54, 57, 67, 63, 65, 65, 68,
61, 61, 64, 64, 64

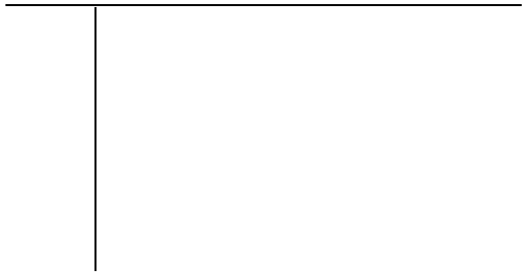
KEY:

d) 23, 26, 29, 22, 25, 28, 25, 25, 22,
33,33, 33, 33, 39, 32, 32, 36, 36,
46, 49, 43, 43, 49, 59, 55, 55, 58,
68, 66, 66, 61, 62

KEY:

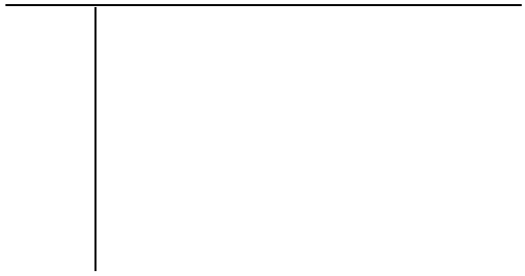
e) 42, 45, 43, 40, 39, 38, 37, 38, 40
43, 43, 40, 37, 37, 38, 40, 40, 40
50, 57, 58, 65, 65, 53, 63, 62,52
69, 58, 63, 58, 62

KEY:



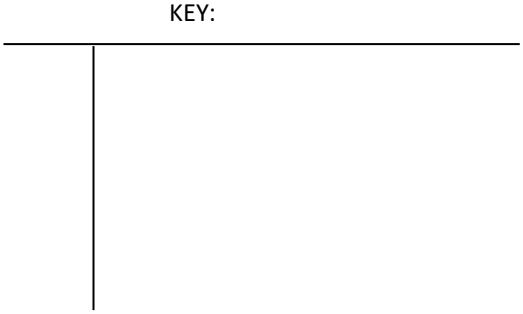
f) 56, 54, 53, 52, 46, 32, 34, 56, 54
46, 32, 54, 52, 53, 54, 56, 32, 32
44, 46, 34, 32, 46, 42, 43, 44, 32
32, 32, 66, 64, 63,

KEY:



g) 26, 24, 23, 22, 26, 22, 24, 26, 24
36, 32, 34, 32, 33, 44, 46, 52, 52
44, 66, 54, 42, 36, 42, 63, 64, 42
52, 62, 66, 64, 63

KEY:



Exercise 5A

Algebraic products

Q1 Expand the brackets.

a) 3 (*x - 5)* _____

b) *4(-x + 6)* _____

c) *7(2x - 4)* _____

d) *-8 (x—7)* _____

e) *-x (x - 5)* _____

f) *xy(y + 2)* _____

g) *xy(x - y)* _____

h) *xy(x^3 - z)* _____

i) *x^2 y(y + x)* _____

j) *abc(ab - bc)* _____

k) *9(xy - y)* _____

l) *-8(a - 6)* _____

m) *xyz(x - y)* _____

n) *x^2 (x– y)* _____

o) *7x(x - 7)* _____

p) *6xy(x - y^2)* _____

Q2 Expand and simplify

a) *(a + b)(c - d)*

_____

_____

b) *(x + y)(a - b)*

_____

_____

c) *(2x + y)(3x - y)*

_____

_____

d) *(x - y)(2a - b)*

_____

_____

e) *(3x + y)(c - d)*

_____

_____

f) *(x - a)(y + a)*

_____

_____

g) *(x - y)(2x + y)*

_____

_____

h) *(4xy - z)(2xy + z)*

_____

_____

i) *(x - 2)(x - 6)*

_____

_____

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

_____

_____

Q3 Expand

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

b) $(x + 7)(x - 8)$

c) $(x - 8)(x + 8)$

d) $(x - 9)(x - 2)$

e) $(2x - 3)(3x - 1)$

f) $(4x - 1)(2x + 1)$

g) $(7x + 1)(4x - 1)$

h) $(6x - 1)(x + 1)$

i) $(2x - 5)(3x + 1)$

j) $(3x + 2)(x + 3)$

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

l) $(x - 9)(2x - 5)$

m) $(x - 11)(3x + 5)$

n) $(x + 6)(2x + 7)$

n) $(4a + 5)(5a - 3)$

Exercise 5B — Algebraic factors(Common factors)

Q1 Factorise the following questions

a) $xy + xz$

b) $ab + bd$

c) $xyz + abx$

d) $abc + bc$

e) $x^2 + x^2 y$

f) $x^2 y + xz$

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

h) $x^2 + y^2 x$

i) $x^2 y + xy^2$

j) $x^3 y + x^2 y$

k) $x^4 y - y^3 x$

l) $xyz - x^2 y$

Q2 Factorise

a) $x^2 + 2x$

b) $2x^2 + 8$

c) $x^3 + 2x$

d) $3x^2 - 9x$

e) $7y^2 - 14y$

f) $5x^2 - 10$

g) $6x^2 - 2x$

h) $3x^2 - 27x$

i) $14x - 14$

j) $3x - 9$

k) $m^2 - 2m$

l) $3m - 15$

m) $12a - 24$

n) $18y - 54$

o) $27a - 81$

Q3 Factorise the following questions

a) $3x^2 - 3x + 9$

b) $2x^2 - 8x - 16x^3$

c) $2y^2 – 4y + 8$

d) $xyz + 2x^2yz + 3xy^2z$

e) $5xy + 10yz + 5ya$

f) $8y - 4x + 12z$

g) $15x^2 - 5x + 20$

h) $7a^2 - 14a + 28$

i) $3y^2 - 6y + 18$

j) $2y^2 + 8x + 6$

k) $9xy + 6yzx + 12xz$

l) $10x^2 - 20x + x^3$

m) $12y^2 - 6y + 2y^3$

n) $4x + 6y + 8z$

o) $7x + 14y + 21a$

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