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TGL

YEAR 8

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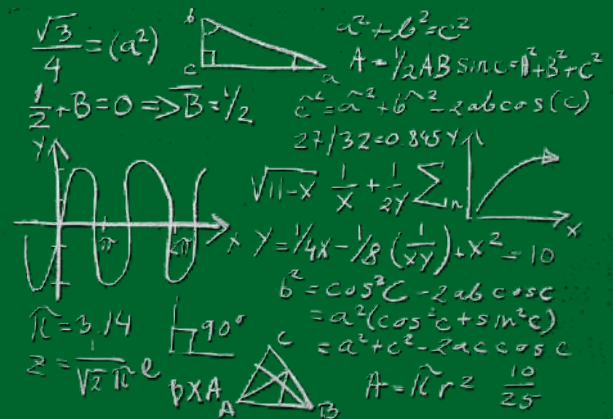
Work Book
For Year 8

BOOK 1

M.Nat

Practice Makes Perfect

Success at your fingertips

Acknowledgements

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M.Nat

Year 8 Workbook

More than **500** questions included

Mr M. Nat

CONTENT PAGE

Basic Arithmetic

Exercise 1A

Addition

Q1 Work out the following.

a) 24 + 26 + 32 = _____

b) 38 + 39 + 43 = _____

c) 124 + 112 + 116 = _____

d) 143 + 36 + 121 = _____

e) 512 + 1011 + 18 = _____

f) 1453 + 1116 = _____

g) 226 + 1226 = _____

h) 1026 + 28 = _____

i) 336 + 438 + 29 = _____

j) 246 + 346 + 32 = _____

Q2 Work out the following.

a) 48.3 + 28.4 = _____

b) 142.4 + 154.5 = _____

c) 27.4 + 32.3 + 10 = _____

d) 24.34 + 38.4 = _____

e) 1132.5 + 346.4 = _____

f) 139.43 + 148.4 = _____

g) 846.1 + 311.3 = _____

h) 28.52 + 32.8 = _____

i) 432.4 + 505.1 = _____

j) 38.34 + 313.5 = _____

Q3 Work out the following.

a) $\dfrac{1}{3} + \dfrac{1}{12} =$ _____

b) $\dfrac{1}{4} + \dfrac{2}{8} =$ _____

c) $1\dfrac{1}{2} + \dfrac{3}{8} =$ _____

d) $\dfrac{1}{6} + \dfrac{2}{3} =$ _____

e) $1\dfrac{1}{3} + 2\dfrac{5}{8} =$ _____

f) $1\dfrac{1}{4} + \dfrac{1}{2} =$ _____

g) $\dfrac{1}{8} + \dfrac{2}{5} =$ _____

h) $\dfrac{1}{9} + \dfrac{2}{7} =$ _____

i) $\dfrac{2}{7} + \dfrac{3}{8} =$ _____

j) $1\dfrac{2}{5} + 2\dfrac{1}{3} =$ _____

Q4 Work out the following.

a) 275 + 332 + 28 = _____

b) 312 + 31.2 + 21.8 = _____

c) 1456 + 372 + 41.7 = _____

d) 372.5 + 23.4 + 36.8 = _____

e) 22.8 + 29.1 + 32.3 = _____

f) 42.7 + 38.3 + 21.8 = _____

g) 39.8 + 121.7 + 345 = _____

h) 23.4 + 38.3 + 20 = _____

i) 71.56 + 33.34 + 32 = _____

j) 246.4 + 212 + 72 = _____

Q5 Work out the following.

a) 0.473 + 26.26 + 32 = _____

b) 4.73 + 35.50 + 43 = _____

c) 248 + 348 + 310 = _____

d) 0.0473 + 0.0326 = _____

e) 0.0026 + 0.263 = _____

f) 0.073 + 7.85 = _____

g) 7.943 + 8.465 = _____

h) 9.054 + 10.068 = _____

i) 0.905 + 0.102 + 0.26 = _____

j) 0.738 + 8.35 + 0.749 = _____

Q1 Work out the following.

a) 79 - 46 = _____   b) 78 - 29 = _____   c) 175 - 116 = _____

d) 278 - 29 = _____   e) 1458 - 1059 = _____   f) 7679 - 6740= _____

g) 969 - 169 = _____   h) 9663 - 1464 = _____   i) 872 - 178 = _____

j) 928 - 279 = _____

Q2 Work out the following.

a) 79.5 - 39.2 = _____   b)78.3 - 38.5 = _____

c) 174.5 - 23.8 = _____   d) 573.8 - 373.7 = _____

e) 1738.4 - 1284.5 = _____   f) 2494.5 - 1954.3 = _____

g) 789.4 - 683.5 = _____   h) 483.26 - 382.27 = _____

i) 283.77 - 182.78 = _____   j) 7883 - 23.9 = _____

Q3 Work out the following in the simplest form.

a) $\dfrac{7}{8} - \dfrac{1}{3} =$ _____   b) $\dfrac{2}{7} - \dfrac{1}{4} =$ _____

5

c) $2\dfrac{2}{3} - \dfrac{1}{8} =$ _____

d) $\dfrac{8}{9} - \dfrac{1}{2} =$ _____

e) $2\dfrac{1}{3} - \dfrac{1}{7} =$ _____

f) $1\dfrac{7}{8} - \dfrac{2}{3} =$ _____

g) $3\dfrac{2}{3} - 1\dfrac{1}{8} =$ _____

h) $4\dfrac{1}{3} - \dfrac{1}{7} =$ _____

i) $\dfrac{7}{9} - \dfrac{1}{8} =$ _____

j) $1\dfrac{7}{8} - \dfrac{2}{3} =$ _____

Q4 Work out the following.

a) 762 - 76.5 = _____

b) 87.7 - 46.2 = _____

c) 1482 - 263 = _____

d) 1248 - 28.3 = _____

e) 963 - 28.7 = _____

f) 1961 - 283 = _____

g) 162.3 - 48.4 = _____

h) 782.3 - 198.5 = _____

i) 999 - 192.9 = _____

j) 489 - 189.3 = _____

Q5 Work out the following.

a) $11 - 1\dfrac{1}{8} =$ _____

b) $14\dfrac{3}{8} - 11\dfrac{2}{7} =$ _____

c) $22\dfrac{3}{7} - 13\dfrac{1}{8} =$ _____

d) $11.7 - 1\dfrac{7}{8} =$ _____

e) $22.8 - \dfrac{1}{8} = $ _____   f) $10\dfrac{1}{7} - 9\dfrac{2}{3} = $ _____

g) $9\dfrac{1}{9} - 1\dfrac{1}{3} = $ _____   h) $11\dfrac{2}{9} - 3\dfrac{3}{8} = $ _____

i) $8\dfrac{3}{8} - 1\dfrac{1}{9} = $ _____   j) $11\dfrac{2}{7} - 7\dfrac{1}{7} = $ _____

Exercise 1C	Multiplication

Q1 Work out the following.

a) 22 x 28 = _____   b) 23 x 35 = _____   c) 78 x 29 = _____

d) 29 x 28 = _____   e) 25 x 28 = _____   f) 18 x 17 = _____

g) 19 x 21 = _____   h) 32 x 31 = _____   i) 48 x 21 = _____

j) 44 x 23 = _____

Q2 Work out the following.

a) 23.2 x 8 = _____   b) 12.2 x 8.1 = _____   c) 18.4 x 11 = _____

d) 13.1 x 8.1 = _____   e) 17.5 x 12 = _____   f) 21.5 x 15 = _____

g) 25.5 x 15 = _____   h) 35.8 x 12.1 = _____   i) 17.7 x 12.1 = _____

j) 25.7 x 12.5 = _____

Q3 Work out the following.

a) $\dfrac{1}{2} \times \dfrac{1}{8}$ = _____

b) $\dfrac{2}{3} \times \dfrac{3}{4}$ = _____

c) $\dfrac{1}{8} \times \dfrac{2}{9}$ = _____

d) $2\dfrac{1}{2} \times \dfrac{1}{8}$ = _____

e) $1\dfrac{1}{3} \times 2\dfrac{1}{6}$ = _____

f) $\dfrac{1}{9} \times 1\dfrac{1}{3}$ = _____

g) $4\dfrac{1}{2} \times 3\dfrac{1}{2}$ = _____

h) $1\dfrac{3}{4} \times 2\dfrac{1}{2}$ = _____

i) $3\dfrac{3}{4} \times \dfrac{3}{8}$ = _____

j) $\dfrac{5}{8} \times \dfrac{1}{5}$ = _____

Q4 Work out the following.

a) $1\dfrac{1}{3} \times 2\dfrac{2}{3}$ = _____

b) 476 x 375 = _____

c) 57.5 x 132.5 = _____

d) $28.5 \times 1\dfrac{1}{3}$ = _____

e) 3112 x 29 = _____

f) $6\dfrac{3}{4} \times 3\dfrac{7}{8}$ = _____

g) $8\dfrac{7}{10} \times 3\dfrac{1}{30}$ = _____

h) 4.72 x 39.6 = _____

8

i) 18.6 x 37.8 = _____ j) 41 x 28 = _____

| **Exercise 1D** | **Division** |

Q1 Work out the following. Give your answer to two decimal places.

a) 72 ÷ 9 = _____ b) 525 ÷ 5 = _____ c) 326 ÷ 22 = _____

d) 724 ÷ 46 = _____ e) 481 ÷ 21 = _____ f) 9735 ÷ 5 = _____

g) 1524 ÷ 6 = _____ h) 5631 ÷ 3 = _____ i) 1392 ÷ 9 = _____

j) 981 ÷ 12 = _____

Q2 Work out the following.

a) 20.6 ÷ 2 = _____ b) 79.5 ÷ 5 = _____ c) 69.93 ÷ 0.3 = _____

d) 863.8 ÷ 2 = _____ e) 9.145 ÷ 0.5 = _____ f) 148.45 ÷ 1.5 = _____

g) 74.8 ÷ 4 = _____ h) 725.5 ÷ 5 = _____ i) 9500 ÷ 0.5 = _____

j) 79.8 ÷ 2 = _____

Q3 Work out the following. (Give the answers in fractions)

a) $\dfrac{1}{2} \div \dfrac{3}{8} =$ _____

b) $\dfrac{3}{7} \div \dfrac{2}{21} =$ _____

c) $1\dfrac{2}{3} \div \dfrac{2}{3} =$ _____

d) $\dfrac{7}{8} \div 2\dfrac{2}{3} =$ _____

e) $\dfrac{5}{9} \div \dfrac{1}{9} =$ _____

f) $1\dfrac{5}{9} \div \dfrac{2}{9} =$ _____

g) $7\dfrac{3}{5} \div 1\dfrac{2}{5} =$ _____

h) $10\dfrac{2}{7} \div 3\dfrac{2}{7} =$ _____

i) $8\dfrac{3}{7} \div 1\dfrac{3}{7} =$ _____

j) $9\dfrac{2}{3} \div 7\dfrac{2}{5} =$ _____

Q4 Work out the following to 2 decimal places.

a) 1112 ÷ 35 = _____

b) $3\dfrac{4}{5} \div 1\dfrac{3}{8} =$ _____

c) 892.5 ÷ 4.5 = _____

d) 9012 ÷ 105 = _____

e) 8912.5 ÷ 4.5 = _____

f) 0.8015 ÷ 0.25 = _____

g) 2012 ÷ 42 = _____

h) 7342 ÷ 22 = _____

i) 3252 ÷ 2.5 = _____   j) $1\dfrac{3}{8} \div 2\dfrac{3}{5} =$ _____

| Exercise 1E | Approximation & rounding off |

Q1 Round off the following numbers to the nearest 10.

a) 45 _____   b) 76 _____   c) 89 _____

d) 159 _____   e) 258 _____   f) 7458 _____

g) 9612 _____   h) 2015 _____   i) 79 _____

j) 179 _____

Q2 Round off the following numbers to the nearest 100.

a) 138 _____   b) 159 _____   c) 1119 _____

d) 728 _____   e) 2315 _____   f) 768 _____

g) 269 _____   h) 12316 _____   i) 7682 _____

j) 9656 _____

Q3 Approximate the following numbers to one decimal place.

a) 52.713 _____   b) 713.223 _____   c) 72.854 _____

d) 6.235 _____   e) 7.025 _____   f) 0.873 _____

g) 0.054 _____   h) 0.721 _____   i) 12.345 _____

j) 13.635 _____

Q4 Approximate the following numbers to two decimal place.

a) 75.345 _____   b) 216.345 _____   c) 125.052 _____

d) 128.356 _____   e) 79.125 _____   f) 89.446 _____

g) 2012.23 _____   h) 92.346 _____   i) 0.0135 _____

j) 0.0263 _____

Q5 Approximate the following numbers to one significant figure.

a) 43.353 _____   b) 7.565 _____   c) 9.432 _____

d) 128.4 _____   e) 11.756 _____   f) 169.2 _____

g) 0.0735 _____   h) 0.345 _____   i) 0.00783 _____

j) 79 _____

Q6 Approximate the following to two significant figures.

a) 82.84 _____   b) 348 _____   c) 9.837 _____

d) 91.73 _____   e) 243.08 _____   f) 0.00623 _____

g) 81.475 _____   h) 73.465 _____   i) 91.695 _____

j) 63.237 _____

Exercise   1F   **Mixed operations**

Q1 Work out the following.

a) 2 + 3 x 5 - 1 = _____   b) (7 + 3) - 8 x 2 = _____

c) (8 ÷ 2) x 2 + (6 - 1) = _____   d) (16 ÷ 2) - 5 ÷ 3 = _____

e) (7 x 2) ÷ 2 + (7 + 3) = _____   f) (9 + 5) ÷ 2 - 4 = _____

g) (70 ÷ 5) ÷ 7 x 2 = _____   h) (160 ÷ 2) - (60 + 20) = _____

i) (90 x 2) - 60 + 20 = _____   j) (20 x 4) - 15 + (2 + 3) = _____

Q2 Work out the following.

a)   ((229.2 x 2) + 6) - (3 x 2.6) = _____

b)   (228.2 + 2.8) - 2 x 6 =   _____

c) 2(223.5 + 25.5) - 75.5 ÷ 2.5 = _____

d) (448.4 + 130.6) - 334.6 = _____

e) (76.8 + 22.2) - 24.8 = _____

f) (46.8 ÷ 2) + 74.6 x 2 = _____

g) 76.8 ÷ 4 x 2 + 44.4 = _____

h) 44.8 ÷ 2 x (7 + 1) - 106 = _____

i) 78.8 ÷ 4 ÷ 2 + 202 = _____

j) (42.4 ÷ 2) - 12 + (40 ÷ 0.5) = _____

Q3 Work out the following. (Where applicable give your answer in fraction form)

a) $\left(\dfrac{2}{3} \times \dfrac{1}{2} \right) \div \dfrac{1}{4} =$ _____

b) $\dfrac{33}{45} \times \dfrac{9}{11} \div \dfrac{2}{11} =$ _____

c) 5.8 x 6.8 - 11.5 = _____

d) 7.8 x 2.2 x 2.9 = _____

e) $2\dfrac{1}{2} \times \dfrac{8}{15} \div 3\dfrac{1}{4} =$ _____

f) $8\dfrac{2}{7} \times \dfrac{2}{3} \div 3\dfrac{7}{8} =$ _____

g) $7\dfrac{1}{7} \div \dfrac{2}{7} \times \dfrac{1}{2} =$ _____

h) $1\dfrac{1}{8} \div \dfrac{7}{8} \times \dfrac{2}{3} =$ _____

i) 3.5 x 2.5 - 7.5 = _____

j) 2(3.5 + 4.5) - 11.5 = _____

| Exercise 1G | | Squares, cubes & powers |

Q1 Use the x^2 key to answer the following.

a) 12^2 _____   b) 25^2 _____   c) 35^2 _____

d) 141^2 _____   e) 128^2 _____   f) 75^2 _____

g) 65^2 _____   h) 191^2 _____   i) 78^2 _____

j) 26^2 _____

Q2 Use the x^y key to answer the following.

a) 12^3 _____   b) 25^3 _____   c) 121^3 _____

d) 18^4 _____   e) 142^3 _____   f) 7^5 _____

g) 8^6 _____   h) 9^3 _____   i) 12^5 _____

j) 101^3 _____

Q3 Answer the following. Give the answers to two decimal places.

a) 21.2^2 _____

b) 18.6^3 _____

c) 12.5^4 _____

d) 13.6^2 _____

e) 121.5^2 _____

f) 37.8^4 _____

g) 45.6^2 _____

h) 46.7^2 _____

i) 15.8^3 _____

j) 17.7^4 _____

Q4 Answer the following. Leave your answers in fraction form.

a) $\left(\dfrac{1}{8}\right)^2$ = _____

b) $\left(1\dfrac{1}{3}\right)^4$ = _____

c) $\left(2\dfrac{2}{3}\right)^4$ = _____

d) $\left(1\dfrac{1}{8}\right)^5$ = _____

e) $\left(1\dfrac{1}{2}\right)^2 + \left(1\dfrac{1}{3}\right)^3$ = _____

| Exercise 1H | Square roots & cube roots |

Q1 Use the square root key to answer the following questions.

a) $\sqrt{81}$ = _____

b) $\sqrt{169}$ = _____

c) $\sqrt{529}$ = _____

d) $\sqrt{36 \times 64}$ = _____

e) $\sqrt{576} + \sqrt{1024}$ = _____

f) $\sqrt{1764}$ = _____

g) $\sqrt{2809}$ = _____

h) $\sqrt{2601}$ = _____

i) $\sqrt{3969}$ = _____

j) $\sqrt{2916}$ = _____

Q2 Use the $\sqrt[x]{y}$ key to answer the following questions.

a) $\sqrt[3]{12167}$ = _____

b) $\sqrt[3]{1728}$ = _____

c) $\sqrt[3]{21952}$ = _____

d) $\sqrt[3]{1953.125}$ = _____

e) $\sqrt[3]{8} \times \sqrt[3]{64}$ = _____

f) $\sqrt[3]{1.728}$ = _____

g) $\sqrt[3]{64} + \sqrt[3]{512}$ = _____

h) $9 \times \sqrt[3]{1728}$ = _____

i) $\sqrt[3]{216}$ = _____

j) $\sqrt[3]{729}$ = _____

Use your calculator to simplify the following to one decimal place.

a) $\sqrt[3]{1.728} \times \sqrt{1.21}$ = _____

b) $\sqrt{0.09} \times \sqrt[3]{1.25}$ = _____

c) $\sqrt[3]{2.744} \times \sqrt{6.4}$ = _____

d) $\sqrt{0.09} \times \sqrt{0.18}$ = _____

e) $\sqrt{0.025} \times \sqrt{0.121}$ = _____

Q4 Use your calculator to simplify the following to two decimal place.

a) $\sqrt{3\dfrac{2}{3}}$ = _____   b) $\sqrt{\dfrac{2}{9}}$ = _____

c) $\sqrt[3]{14\dfrac{2}{3}}$ = _____   d) $\sqrt{\dfrac{4}{7}} \times \sqrt[3]{3\dfrac{1}{4}}$ = _____

e) $\sqrt[3]{\dfrac{8}{20}} \times \sqrt[3]{17}$ = _____   f) $\sqrt{3\dfrac{3}{5}} - \sqrt[3]{3\dfrac{5}{7}}$ = _____

g) $\sqrt[3]{5\frac{3}{7}} - \sqrt{\frac{4}{9}} =$ _____ h) $\sqrt{\frac{62}{91}} + \sqrt{\frac{32}{25}} =$ _____

i) $\sqrt[3]{39\frac{2}{3}} =$ _____ j) $\sqrt{64} + \sqrt[3]{3\frac{1}{4}} =$ _____

Exercise 1I

Problem solving

1) Find the cube root of $4\frac{4}{15}$ correctly to two decimal places.

   _____

2) Find the square root of the average of the following numbers; 3.75, 4.25, 6.75, 4.5. Give your answers correctly to two decimal places.

   _____

3) Find the cost o 35 pencils at the rate of £1.45 each. _____

4) Find the cost of 13.5kg of vegetables at the rate of £6.55 a kilogram.

   _____

5) How many 30 pence stickers can we buy for £44.50? _____

6) Find the value of $\frac{1}{3} \times 8.259 \times 8^2$ correctly to two decimal places.

   _____

7) A cube has a volume of 1728 cm^3. Find the length of each side of the cube.

_____

8) Divide £3063 equally among three people. _____

9) A rectangular prism has sides 8cm, 11.2cm, 12.1cm. Find its volume. _____

10) Use your calculator to evaluate $\sqrt{14^2 - 7^2} + (3.5)^2$ correctly to two decimal places.

_____

11) How much would 62 books cost, if one book costs £5.95? _____

12) Write 75683 correctly to the nearest thousand. _____

13) Calculate the volume of a cube with a side of 5.4cm. _____

14) In a class of 36 students, $\frac{1}{6}$ travel to school by bus. How many students travel by bus?

_____

15) How many 15ml bottles could be filled from a litre of a fluid container ?

_____

Algebra

Exercise 2A

Addition & subtraction of like terms

Q1 Simplify the following expressions by collecting the like terms.

a) 2a + 3a = _____

b) $7x + 4x =$ _____

c) $3a^2 + 2a^2 =$ _____

d) 9m - 3m = _____

e) 3l + 9l = _____

f) $2a^3 + 3a^3 =$ _____

g) $8x + 9x =$ _____

h) $2xy + 3xy =$ _____

i) $-2x + 14x =$ _____

j) $-3xy - 4xy =$ _____

k) $14x + 7x =$ _____

l) 5p + 12p = _____

m) -7p - 3p = _____

n) 9m + 6m = _____

o) 20n - 7n = _____

p) 7b + 14b = _____

Q2 Simplify the following.

a) $2x + 5x + 7x =$ _____

b) 3p - 4p +7p =_____

c) $3x^2 - 4x^2 + 8x^2 =$ _____

d) $9xy - 4xy + 2xy =$ _____

e) 7p - 2p + 8p = _____   f) 9m - 4m + 7m = _____

g) 3n - 14n + 7n = _____   h) 3mn - 4mn + 7mn = _____

i) 9p - 7p - 4p = _____   j) 11mx - 2mx +7mx = _____

k) 2xy - 3xy - 2xy = _____   l) 3xy - 4x^2y + 2x^2y =_____

m) 4x^3y^2 - 2x^3y^2 + 7x^3y^2 = _____   n) 7x^3ym - 2x^3ym + 9x^3ym = _____

o) 2a^{2}b - 7a^{2}b + 11a^{2}b = _____   p) -xy - 7xy + 5xy = _____

Q3 Simplify the following.

a) 2x + 3y + 5x = _____   b) 3x + 3y + 4x - y =_____

c) 2x^2 + 3x^3 + x^2 - x^3 = _____   d) 9xy +2x2y + x2y + xy = _____

e) -x + 2m + 5x - m = _____   f) -y + 3y + 4x = _____

g) 7x + 3y + 2x = _____   h) 9m + 2n - 3m + n = _____

i) -9p - 2q - p = _____   j) 7x^2y - 2x^3y + x^2y + xy = _____

k) xy + x^2y + 2xy - 7x^2y = _____   l) 9ab + 2a^{2}b + ab = _____

m) x^2y + xy - 3x^2y + xy = _____   n) 6ab - 2p + ab +7p = _____

o) 11xy - 2xy + 2x^2y = _____   p) 2x^2y - 3x^2y + x^3y = _____

Exercise 2B	Multiplication & division

Q1 Work out the following.

a) $2x \times z =$ _____

b) $-3x \times -2x =$ _____

c) $7x \times 3y =$ _____

d) $7x \times 4y =$ _____

e) $(-6x) \times (-3xy) =$ _____

f) 7m x 3ab = _____

g) (-2a) x (-3b) = _____

h) $(-3y) \times 7 =$ _____

i) $4x \times 3x \times 2y =$ _____

j) $xy \times x =$ _____

k) 7 x 3b x b = _____

l) (-7m) x (-5m) = _____

m) (-9m) x (-2m) = _____

n) $7xy \times 7 =$ _____

o) (-8m) x (-2n) = _____

p) $(-5y) \times (-4y) =$ _____

Q2 Work out the following.

a) $(-18xy) \div (-9x) =$ _____

b) $\dfrac{16a}{2} =$ _____

c) $7x \div (-7) =$ _____

d) $\dfrac{7a^2b}{ab} =$ _____

e) $(-21x) \div 7x =$ _____

f) 70ab ÷ 10ab = _____

g) $xy^3 \div xy =$ _____

h) $(-48x) \div (-6) =$ _____

i) 70m ÷ (-7m) = _____

j) $a^2b \div ab =$ _____

k) $9x \div (-9) =$ _____

l) 21ab ÷ (-3ab) = _____

m) $(-125xy) \div 5y =$ _____ n) $25ab \div 5a =$ _____

o) $15xy \div (-3) =$ _____ p) $16xy \div (-4x) =$ _____

Q3 Simplify the following.

a) 3a x 4a x 2b = _____ b) 7a x 2b x 4 = _____

c) $4x \times 8 \div 2x =$ _____ d) $5x \times 7xy \div x^2 y =$ _____

e) (-3a) x 6a x (-4) = _____ f) 9 x 7m ÷ 3 = _____

g) $(4a)^2 \div 2a =$ _____ h) $13x \times 4x \div (-4x) =$ _____

i) $9xy \times 3x \div x^2 y =$ _____ j) $(-4) \times (-2x) \times 7 =$ _____

k) $15xy \div (-5xy) =$ _____ l) $7x^2 y \div xy =$ _____

m) 21ab ÷ 3ab x (-5) = _____ n) $22xy \div 2xy =$ _____

o) $24x^2 y \div 4xy \times 2 =$ _____ p) 48ab ÷ (-4ab) x (-4) = _____

Exercise 2C	Indices

Q1 Simplify the following ($a^m \times a^n = a^{m+n}$)

a) $x^7 \times x^4 =$ _____ b) $p^5 \times p^{-2} =$ _____ c) $x^4 \times x^3 \times x^2 =$ _____

d) $x^9 \times x^2 =$ _____ e) $a^2 b \times a^3 b =$ _____ f) $x^{-5} \times x^2 =$ _____

g) $5x \times 9x^3 =$ _____ h) $p^7 \times p^2 \times p^{-5} =$ _____ i) $x^3 y^2 \times x^{-2} y^3 =$ _____

j) $8a^4 \times 6a^3 =$ _____ k) $10x^5 \times 5x^{-2} =$ _____ l) $a^3b \times a^2b^{-2} =$ _____

m) $5x \times 3x^5 =$ _____ n) $7x^2 \times 8x^3 =$ _____ o) $7x^2y \times 2x \times 3y^2 =$ _____

p) $a^4b \times a^{-3}b^2 =$ _____

Q2 Simplify the following ($a^m \div a^n = a^{m-n}$)

a) $x^8 \div x^2 =$ _____ b) $x^9 \div x^{-2} =$ _____ c) $7x^6 \div x^2 =$ _____

d) $k^8 \div k =$ _____ e) $\dfrac{p^7}{p^2} =$ _____ f) $m^4n^2 \div m^2 =$ _____

g) $x^3y^2z \div xyz =$ _____ h) $49a^5 \div 7a^3 =$ _____ i) $x^6y^3 \div x^3 =$ _____

j) $12a^7x^5 \div 3a^4x^3 =$ _____ k) $x^4y^2 \div xy =$ _____ l) $m^{-4} \div m^{-2} =$ _____

m) $m^9 \div m^2 =$ _____ n) $mn^7 \div m^4n =$ _____ o) $pq^6 \div p^2q^2 =$ _____

p) $x^8y^2 \div x^{-2}y^4 =$ _____

Q3 Simplify the following ($(a^m)^n = a^{mn}$)

a) $(a^3)^4 =$ _____ b) $(y^4)^{-2} =$ _____ c) $(x^5)^3 =$ _____

d) $(2x^2)^3 =$ _____ e) $(xy)^7 =$ _____ f) $(3y^2)^3 =$ _____

g) $(x^4y^2)^2 =$ _____ h) $(5a^2b^2)^2 =$ _____ i) $(7xy^2)^2 =$ _____

j) $(3a^3y^2)^2 =$ _____ k) $(7x^3)^2 =$ _____ l) $(-3ab^2)^3 =$ _____

m) $(-3a^2b)^2 =$ _____ n) $(x^4)^3 =$ _____ o) $(-a^2)^2 =$ _____

p) $(6p^3)^2 =$ _____

Q4 Use the index laws to simplify the following.

a) $10x^0 =$ _____ b) $a^8 \div b^7 =$ _____ c) $(m^3)^7 =$ _____

d) $x^0 + (2x)^0 =$ _____ e) $3x^5 \div x^2 \times 6x =$ _____ f) $x^4 \div x^2 =$ _____

g) $9a^5 \div a^4 =$ _____ h) $x^7y^5 \div xy^4 =$ _____ i) $10a^6 \div 2a^2 =$ _____

j) $x^{10} \div x^6 =$ _____ k) $15xy^4 \div 3xy^3 =$ _____ l) $(x^7)^2 =$ _____

m) $(2x^0)^3 \div (x^5)^2 =$ _____ _ n) $(9x^2)^2 =$ _____ o) $3x^5 \div x^2 =$ _____

p) $(7x^3)^2 =$ _____

Exercise 2D | **Removing brackets**

Q1 Expand the following expressions.

a) $3(x-5) =$ _____ b) $-4(x-2) =$ _____

c) $-3(x-2) =$ _____ d) $a(x-3) =$ _____

e) $9(x+5) =$ _____ f) $-3(x-5) =$ _____

g) $2a(3+x) =$ _____

h) $-2x(-3 + x) =$ _____

i) $2x(x^2 + 3) =$ _____

j) $3x(x^4 + 3x) =$ _____

k) $4x(x^2 - 4) =$ _____

l) $4x(x^3 - 2) =$ _____

m) $5x(x - 7) =$ _____

n) $x^2(x^4 - 3) =$ _____

o) $7x(x + 8) =$ _____

p) $x^{-2}(x^6 + 2x) =$ _____

Q2 Expand and simplify by collecting the like terms.

a) $2(x + 2) + 4 =$ _____

b) $2(x - 3) + 3(x - 2) =$ _____

c) $4(x - 5) - 2(x - 5) =$ _____

d) $6(x + 5) + 2 =$ _____

e) $-5(x - 5) - 3 =$ _____

f) $-2(x^2 + 3) + x^2 =$ _____

g) $2x + 3(x + 2) + 7 =$ _____

h) $7y - 2(y - 3) + 2 =$ _____

i) $2y(y + 2) - 3y^2 =$ _____

j) $4y(y - 2) - 3y(y - 2) =$ _____

k) $7y(y - 3) - 2y(y - 1) =$ _____

l) $2(y - 3) + 3(y - 2) =$ _____

m) $5y^2 + 2(y^2 - 2) =$ _____

n) $7y(y - 3) + 2(y^2 - 1) =$ _____

o) $-5y(y - 3) + 4y(y - 4) =$ _____

p) $2y^2 + 3(y^2 - 4) =$ _____

Q3 Expand and simplify by collecting the like terms.

a) $2(x-1) + 3(x-3) =$ _____

b) $x(x+3) + 2(x^2-3) =$ _____

c) $-2(x-2) - 3(x+3) =$ _____

d) $x(5x+6) - 3(x^2-3) =$ _____

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

f) $4x(x+1) - 5x^2 =$ _____

g) $6x(x-1) - 4x(x+3) =$ _____

h) $-x(x+5) + 2x(x-5) =$ _____

i) $-7x(x+3) - 2(x+1) + x(x-1) =$ _____

j) $8(x+2) - (2x-1) + x(x+1) =$ _____

Exercise 2E	Substitution

Q1 Evaluate the following using a= 1, b= 3, c= -1 and d= 4.

a) abc = _____   b) 2a + c = _____   c) a^2b = _____

d) $a^2c - d^2$ = _____   e) $bcd - a^2$ = _____   f) bc - ad = _____

g) c²d + ab = _____   h) b²c - ad = _____   i) bd - ac = _____

j) a²b²c² - d² = _____

If a = 4, find the value of the following.

a) a² - 12 = _____   b) $\sqrt{2a^2 - 16}$ = _____   c) 6a - 7 = _____

d) (a - 2)² = _____   e) $\sqrt{(a-1)^2 + 7}$ = _____   f) a³ = _____

g) a³ - 4 = _____   h) a⁴ - a³ = _____   i) a⁴ - 2 = _____

j) $\sqrt{a^3 - 1}$ = _____

If x= 4.5, y= 2.5, and z= 2.4, find the value of the following to one decimal

a) x² - 3 = _____   b) $\sqrt{x + y + z}$ = _____

c) $\sqrt{x^2 + y - z}$ = _____   d) $\sqrt{(x-3)^2 + (z-1)}$ = _____

e) 2x + 3y + z = _____   f) 3(x - 1)² + 7 = _____

g) xyz + z = _____   h) x²y + y²z = _____

i) xy + y²z + xz = _____   j) x³y + y³ = _____

Q1 Factorise the following by taking the highest common factor out.

a) $4x + 4 =$ _____

b) $7x - 7 =$ _____

c) $3x + 3 =$ _____

d) $9m + 9 =$ _____

e) $8n + 8 =$ _____

f) $4p + 6 =$ _____

g) $7q + 14 =$ _____

h) $7x - 14y =$ _____

i) $3a + 9 =$ _____

j) $9x - 18 =$ _____

k) $2n - 8 =$ _____

l) $14x - 28 =$ _____

m) $5p - 25 =$ _____

n) $6p - 12 =$ _____

Q2 Factorise by taking the common factor out.

a) $8a + 8b =$ _____

b) $7m + 7n =$ _____

c) $3p - 3q =$ _____

d) $m^2 + m =$ _____

e) $2m^2 - 4m =$ _____

f) $mn + n =$ _____

g) $2m^3 - 2m^2 =$ _____

h) $m^2n + n^2m =$ _____

i) $10m - 5 =$ _____

j) $11m + 22 =$ _____

k) $xy - x^2y =$ _____ l) $10p + 10 =$ _____

m) $10p^2 - 5p =$ _____ n) $10pq + q =$ _____

Q3 Factorise the following.

a) $-4a + 8 =$ _____ b) $-5a + 10 =$ _____

c) $-a^2 + a =$ _____ d) $-10p + 10 =$ _____

e) $-7a + 28 =$ _____ f) $-2a^2 + a =$ _____

g) $-5a^2 + 5 =$ _____ h) $-10a^2 + 10a =$ _____

i) $-m^3 + m^2 =$ _____ j) $-3a + 27 =$ _____

k) $-8y + 4x =$ _____ l) $-5x - 5 =$ _____

m) $-4y - 2x =$ _____ n) $-x^2y - xy =$ _____

Exercise 2G **Addition & subtraction of algebraic fractions**

Q1 Find the sum of these algebraic fractions, giving your answer in the simplest form.

a) $\dfrac{p}{2} + \dfrac{p}{2} =$ _____ b) $\dfrac{x}{7} + \dfrac{x}{7} =$ _____ c) $\dfrac{m}{8} + \dfrac{m}{8} =$ _____

d) $\dfrac{2x}{7} + \dfrac{3x}{7} =$ _____ e) $\dfrac{7y}{9} + \dfrac{2y}{9} =$ _____ f) $\dfrac{x}{2} + \dfrac{x}{4} =$ _____

g) $\dfrac{3a}{4} + \dfrac{a}{5} = $ _____

h) $\dfrac{7x}{6} + \dfrac{x}{8} = $ _____

i) $\dfrac{2x}{3} + \dfrac{x}{4} = $ _____

j) $\dfrac{4y}{5} + \dfrac{2y}{7} = $ _____

k) $\dfrac{4p}{7} + \dfrac{2p}{9} = $ _____

l) $\dfrac{p}{9} + \dfrac{2p}{7} = $ _____

Q2 Subtract the following algebraic fraction.

a) $\dfrac{3x}{8} - \dfrac{x}{8} = $ _____

b) $\dfrac{4m}{7} - \dfrac{m}{7} = $ _____

c) $\dfrac{8a}{9} - \dfrac{2a}{9} = $ _____

d) $\dfrac{2x}{7} - \dfrac{x}{2} = $ _____

e) $\dfrac{7y}{9} - \dfrac{2y}{9} = $ _____

f) $\dfrac{7x}{6} - \dfrac{x}{8} = $ _____

g) $\dfrac{4y}{5} - \dfrac{2y}{7} = $ _____

h) $\dfrac{p}{9} - \dfrac{2p}{7} = $ _____

i) $\dfrac{7x}{9} - \dfrac{x}{3} = $ _____

j) $\dfrac{6x}{7} - \dfrac{2x}{5} = $ _____

k) $\dfrac{x}{3} - \dfrac{x}{2} = $ _____

l) $\dfrac{2x}{5} - \dfrac{x}{2} = $ _____

Q3 Find the answers to the following.

a) $\dfrac{3x}{4} + \dfrac{x}{4} = $ _____

b) $\dfrac{5x}{4} - \dfrac{x}{4} = $ _____

c) $\dfrac{2x}{5} - \dfrac{x}{5} = $ _____

d) $\dfrac{p}{7} - \dfrac{2p}{3} = $ _____

e) $\dfrac{4x}{7} - \dfrac{2x}{14} = $ _____

f) $\dfrac{5x}{3} - \dfrac{x}{5} = $ _____

g) $\dfrac{7x}{10} - \dfrac{x}{10} =$ _____   h) $\dfrac{9x}{20} - \dfrac{x}{10} =$ _____   i) $\dfrac{x}{7} - \dfrac{2x}{5} =$ _____

j) $\dfrac{x}{11} - \dfrac{2x}{10} =$ _____

Exercise 2H   **Multiplication & division of algebraic fractions**

Q1 Find the product of these algebraic fractions.

a) $\dfrac{x}{5} \times \dfrac{6}{x} =$ _____   b) $\dfrac{7}{a} \times \dfrac{a}{5} =$ _____   c) $\dfrac{x}{3} \times \dfrac{6}{2x} =$ _____

d) $\dfrac{ab}{5} \times \dfrac{a}{b} =$ _____   e) $\dfrac{9x}{18} \times \dfrac{x}{9} =$ _____   f) $\dfrac{a^2b}{10} \times \dfrac{5}{ab} =$ _____

g) $\dfrac{2x}{9} \times \dfrac{9}{4x} =$ _____   h) $\dfrac{2x^2}{5} \times \dfrac{10}{x^2} =$ _____

Q2 Divide the following algebraic fractions.

a) $\dfrac{x}{4} \div \dfrac{2x}{8} =$ _____   b) $\dfrac{x^2}{10} \div \dfrac{zx}{5} =$ _____   c) $\dfrac{7x}{9} \div \dfrac{7}{9} =$ _____

d) $\dfrac{xy}{5} \div \dfrac{x^2y}{10} =$ _____   e) $\dfrac{2x}{3} \div \dfrac{5x^2}{9} =$ _____   f) $\dfrac{a^2b}{10} \div \dfrac{5}{ab} =$ _____

g) $\dfrac{x^2y}{13} \div \dfrac{x^3y}{26} =$ _____   h) $\dfrac{11x}{22} \div \dfrac{10x}{44} =$ _____

Q3 Find the answers to the following.

a) $\dfrac{8x}{16} \times \dfrac{16}{4} =$ _____

b) $\dfrac{3x}{25} \div \dfrac{4x}{5} =$ _____

c) $\dfrac{abc}{7} \div \dfrac{ab}{14} =$ _____

d) $\dfrac{2pq}{5} \div \dfrac{25}{3pq} =$ _____

e) $\dfrac{9x^2}{28} \div \dfrac{3x^3}{56} =$ _____

f) $\dfrac{7x}{11} \times \dfrac{22}{14x} =$ _____

g) $\dfrac{ax^2}{bx^3} \div \dfrac{b^2x^4}{ax^3} =$ _____

h) $\dfrac{8x^3}{2y^3} \div \dfrac{4x^4}{3y^2} =$ _____

Exercise 2I

Problem solving

1) Find the expression 5 more than $2x$.   _____

2) Write the sum of $3x$ and $4y$.   _____

3) Find the perimeter of a square with a side length of 5cm.   _____

4) If the first number is x, write the next consecutive integer.   _____

5) Find the volume of a cube with a side length of 3cm.   _____

6) Find the number y less than $2x + 3y$.   _____

7) Increase $7y$ by 3.   _____

8)   Three different types of sweets cost $5x$, $3x$ and $7x$ pence each. If I buy 3 of each type, what would be the total cost?

_____

9) Write the perimeter of the following shapes, giving your answer in a simplified form:

a)

$x + 7$

y

b)

$2p$ p $3p$

$6p$

_____

_____

c)

y $4y$

$6y$

_____
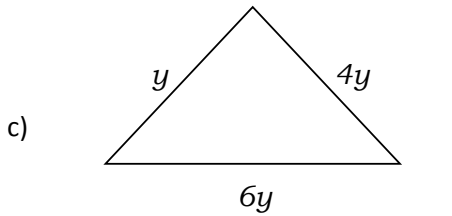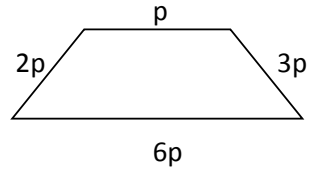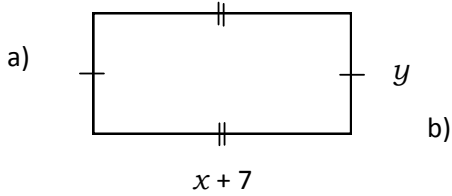
10) Find the area of the following shapes, giving your answer in a simplified form:

a)

$2x$

$x - 7$

b)

$2x$

$4x + 8$

_____

_____

c)

$2x$

$(x + 7)$

_____
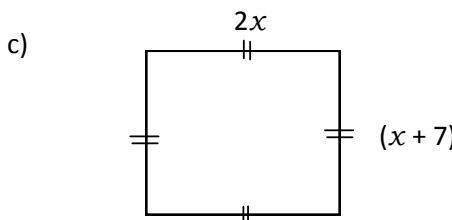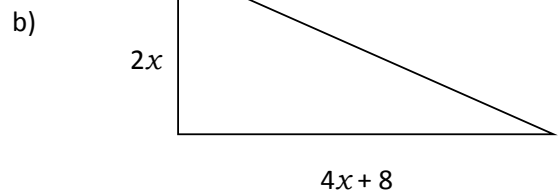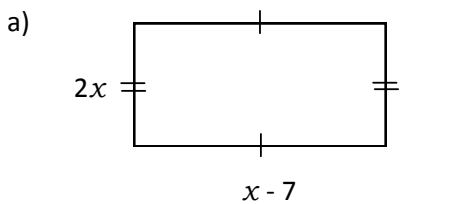
Percentages

Exercise 3A

Changing percentages to fractions

Q1 Express the following percentages as fractions in the simplest form.

a) 40% = _____ b) 20% = _____ c) 35% = _____

d) 10% = _____ e) 75% = _____ f) 60% = _____

g) 15% = _____ h) 32% = _____ i) 80% = _____

j) 70% = _____ k) 90% = _____ l) 100% = _____

m) 18% = _____ n) 23% = _____ o) 34% = _____

p) 35% = _____

Q2 Express the following percentages as fractions in the simplest form.

a) 3.5% = _____ b) 2.5% = _____ c) 5.5% = _____

d) 4.5% = _____ e) 23.5% = _____ f) 62.5% = _____

g) 75.5% = _____ h) 0.5% = _____ i) 12.5% = _____

j) 30.2% = _____ k) 7.5% = _____ l) 24.5% = _____

m) 6.5% = _____ n) 60.5% = _____ o) 17.5% = _____

p) 16.2% = _____

Q3 Change the following percentages to fractions in the simplest form.

a) $\frac{1}{5}\% =$ _____

b) $\frac{1}{3}\% =$ _____

c) $12\frac{1}{2}\% =$ _____

d) $1\frac{1}{2}\% =$ _____

e) $2\frac{1}{2}\% =$ _____

f) $33\frac{1}{3}\% =$ _____

g) $75\frac{1}{2}\% =$ _____

h) $8\frac{1}{2}\% =$ _____

i) $\frac{1}{4}\% =$ _____

j) $22\frac{1}{2}\% =$ _____

k) $18\frac{1}{2}\% =$ _____

l) $9\frac{1}{2}\% =$ _____

m) $66\frac{2}{3}\% =$ _____

n) $10\frac{1}{2}\% =$ _____

Q4 Convert the following into fractions in the simplest form.

a) 77% = _____

b) 56% = _____

c) $25\frac{2}{3}\% =$ _____

d) 7.2% = _____

e) 82% = _____

f) 7.9% = _____

g) 42% = _____

h) 4.2% = _____

i) $4\frac{1}{4}\% =$ _____

j) 52% = _____

Q1 Express the following fractions a percentage.

a) $\dfrac{10}{100}$ = _____

b) $\dfrac{40}{100}$ = _____

c) $\dfrac{60}{100}$ = _____

d) $\dfrac{22}{100}$ = _____

e) $\dfrac{45}{100}$ = _____

f) $\dfrac{65}{100}$ = _____

g) $\dfrac{12}{100}$ = _____

h) $\dfrac{24}{100}$ = _____

i) $\dfrac{11}{100}$ = _____

j) $\dfrac{76}{100}$ = _____

k) $\dfrac{85}{100}$ = _____

l) $\dfrac{99}{100}$ = _____

Q2 Express the following fractions a percentage.

a) $\dfrac{12}{20}$ = _____

b) $\dfrac{11}{20}$ = _____

c) $\dfrac{5}{10}$ = _____

d) $\dfrac{17}{20}$ = _____

e) $\dfrac{8}{25}$ = _____

f) $\dfrac{7}{20}$ = _____

g) $\dfrac{22}{40}$ = _____

h) $\dfrac{9}{25}$ = _____

i) $\dfrac{8}{10}$ = _____

j) $\dfrac{18}{20}$ = _____   k) $\dfrac{7}{50}$ = _____   l) $\dfrac{2}{25}$ = _____

Q3 Change the following fractions to percentages.

a) $\dfrac{2}{5}$ = _____   b) $\dfrac{3}{8}$ = _____   c) $\dfrac{1}{5}$ = _____

d) $\dfrac{7}{80}$ = _____   e) $\dfrac{3}{40}$ = _____   f) $\dfrac{9}{20}$ = _____

g) $\dfrac{11}{40}$ = _____   h) $\dfrac{2}{25}$ = _____   i) $\dfrac{9}{60}$ = _____

j) $\dfrac{7}{80}$ = _____   k) $\dfrac{13}{20}$ = _____   l) $\dfrac{14}{20}$ = _____

Exercise 3C   **Changing percentages to decimals**

Q1 Express the following percentages as decimals.

a) 80% = _____   b) 70% = _____   c) 12% = _____

d) 40% = _____   e) 75% = _____   f) 65% = _____

g) 45% = _____   h) 25% = _____   i) 60% = _____

j) 69% = _____ k) 72% = _____ l) 62% = _____

m) 95% = _____ n) 99% = _____

Q2 Convert the following percentages to decimals.

a) 3% = _____ b) 6% = _____ c) 8% = _____

d) 1.5% = _____ e) 2.5% = _____ f) 7.5% = _____

g) 12.5% = _____ h) 4.8% = _____ i) 21.3% = _____

j) 3.3% = _____ k) 1.8% = _____ l) 1.4% = _____

m) 2.3% = _____ n) 2.4% = _____

Q3 Change the following percentages to decimals.

a) 78.7% = _____ b) 48.7% = _____ c) 92.5% = _____

d) 22.5% = _____ e) 23.5% = _____ f) 85.1% = _____

g) 18.5 = _____ h) 17.5% = _____ i) 45.5% = _____

j) 46.6% = _____

Q4 Express the following percentages as decimals.

a) $2\frac{2}{3}\%$ = _____   b) $12\frac{1}{2}\%$ = _____   c) $13\frac{1}{2}\%$ = _____

d) $20\dfrac{3}{4}\% =$ _____   e) $7\dfrac{3}{4}\% =$ _____   f) $\dfrac{1}{8}\% =$ _____

g) $1\dfrac{1}{3}\% =$ _____   h) $\dfrac{7}{8}\% =$ _____

Exercise 3D   **Changing decimals to percentages**

Q1 Express the following decimals as percentages.

a) 0.25 = _____   b) 0.37 = _____   c) 0.75 = _____

d) 0.88 = _____   e) 0.22 = _____   f) 0.68 = _____

g) 0.11 = _____   h) 0.48 = _____   i) 0.65= _____

j) 0.17 = _____   k) 0.78 = _____   l) 0.35 = _____

Q2 Express the following decimals as percentages.

a) 0.70 = _____   b) 0.50 = _____   c) 0.1 = _____

d) 0.80 = _____   e) 0.3 = _____   f) 0.01 = _____

g) 0.09 = _____   h) 0.12 = _____   i) 0.05 = _____

j) 0.15 = _____   k) 0.07 = _____   l) 0.32 = _____

m) 0.07 = _____   n) 0.03 = _____

Q3 Express the following decimals as percentages.

a) 0.258 = _____   b) 0.765 = _____

c) 0.157 = _____   d) 0.065 = _____

e) 0.267 = _____   f) 0.724 = _____

g) 0.168 = _____   h) 0.765 = _____

i) 0.468 = _____   j) 0.362 = _____

Q4 Express the following decimals as percentages.

a) 0.002 = _____   b) 0.003 = _____

c) 0.0012 = _____   d) 0.007 = _____

e) 0.006 = _____   f) 0.0016 = _____

g) 0.086 = _____   h) 0.0019 = _____

i) 0.0098 = _____   j) 0.038 = _____

Q5 Express the following decimals as percentages.

a) 1.3 = _____   b) 2.7 = _____   c) 1.35 = _____

d) 7.75 = _____   e) 3.06 = _____   f) 6.63 = _____

g) 8.03 = _____   h) 7.68 = _____   i) 9.28 = _____

j) 9.78 = _____

| Exercise 3E | | Finding the percentage of a quantity |

Q1 Evaluate the following.

a) 10% of 40 = _____   b) 50% of 180 = _____

c) 10% of 630 = _____   d) 20% of 210 = _____

e) 25% of 470 = _____   f) 60% of 225 = _____

g) 5% of 600 = _____   h) 100% of 89 = _____

i) 65% 0f 2000 = _____   j) 45% of 125 = _____

Q2 Work out the following.

a) 1% of 65 = _____   b) 1.5% of 48 = _____

c) 2.4% of 330 = _____   d) 2.8% of 75 = _____

e) 6.5% of 780 = _____   f) 87.5% of 180 = _____

g) 6.9% of 85 = _____   h) 45.6% of 452 = _____

Q3 Calculate the following.

a) 18% of 400 = _____   b) 2.5% of £90 = _____

c) 120% of £1000 = _____   d) 18% of 500 = _____

e) $4\frac{1}{2}\%$ of £2000 = _____   f) 5% of 400 = _____

g) 8% of 800 = _____   h) 12.5% of 360 = _____

i) 110% of 1200 = _____   j) 17.5% of 400 = _____

Exercise 3F   **Increasing or decreasing by a given percentage**

Q1 Increase the following by the given percentage.

a) £100 by 10% _____   b) £400 by 40% _____

c) £800 by 2.5% _____   d) £1000 by 5% _____

e) £350 by 40% _____   f) £1200 by 20% _____

g) £1400 by 1.5% _____   h) 600cm by 80% _____

i) 240litres by 50% _____   j) 100minutes by 25% _____

Q2 Decrease the following by the given percentage.

a) £40 by 5% _____

b) £200 by 25% _____

c) £260 by 12.5% _____

d) £1400 by 50% _____

e) 1400 litres by 5% _____

f) £800 by 20% _____

g) £7000 by 10% _____

h) £520 by 15% _____

i) £940 by 20% _____

j) £840 by 10% _____

Q3 Answer the following.

a) Peter bought a car for £130,000. If the price of the car rises by 10%, find the new price of the car.

_____

b) Sharmi pays a tuition fee of £40 per month. If the fees decrease by 10% from next month, what is the new fee for next month?

_____

c) The price of the house in Hayes is £540, 000. If the price is increased by 15% after six months, what is the new price of the house after six months?

_____

Q1 What percentage is:

a) 20 of 40 = _____

b) 15 of 80 = _____

c) 14 of 28 = _____

d) 20 of 120 = _____

e) 81 of 190 = _____

f) 15 of 60 = _____

g) 42 of 84 = _____

h) 75 of 225 = _____

i) 10 of 50 = _____

j) 19 of 152 = _____

Q2 In the following, what percentage is the first quantity of the second quantity?

a) 4m , 16m = _____

b) 8s , 48s = _____

c) 30ml , 150ml = _____

d) 4mins , 2h = _____

e) 40cm , 4m = _____

f) 80m , 240m = _____

g) 200g , 5kg = _____

h) 8l , 1000l = _____

i) 150g , 750g = _____

j) 48s , 4mins = _____

Q3 Write the first quantity as a fraction of the second quantity.

a) 60g , 90g = _____

b) 25ml , 85ml = _____

c) 50kg , 130kg = _____

d) 25p , £2.50 = _____

e) 5p , 75p = _____   f) 50cm , 140m = _____

g)   The cost of a book at 45p compared with the cost of a box at £1.20.

_____

h)   The cost of a manual sharpener at 64p compared with an electronic sharpener at £2.60.

_____

i)   A computer costs £120. A computer game costs £40. Write the cost of the game as a
      fraction of the cost of the computer.

_____

j)   Write £25 as a fraction of £75.

_____

Give your answers to two decimal places.

1)   Decrease £200 by 20% and then increase the result by 5%.

_____

2)   If 25% of a number is 50. What is the number?

_____

3) A car price is £1000, the retailer sells this car for £15000. What percentage of profit is made?

_____

4) Find 40% of 1000 and add it with 30% of 2000.

_____

5) Shoba got 40 out of 60. What is the percentage of marks she got?

_____

6) In the GCSE examination 80% of a class of 40 students passed. How many students failed?

_____

7) Find the simple interest on £3560 for 3 years at 9.5% per annum.

_____

8) A full prize of a shoe is marked at £300, what is the prize of it, if a discount of $10\frac{1}{4}\%$ is allowed?

_____

9) Increase £250 by 15%.

_____

10) Increase £300 by 10% and add it with 15% of 1500.

_____

Equations and Formulas

Exercise 4A

Addition & subtraction of one step equations

Q1 Solve the following equations.

a) $x + 8 = 10$ _____

b) $x + 7 = 15$ _____

c) $x + 10 = 15$ _____

d) $x - 8 = 10$ _____

e) $x - 7 = 12$ _____

f) $x + 4 = 10$ _____

g) $x - 20 = 10$ _____

h) $x + 8 = 22$ _____

i) $x - 8 = -2$ _____

j) $x + 12 = -2$ _____

k) $x + 13 = -2$ _____

l) $x + 3 = 12$ _____

m) $x - 3 = -10$ _____

n) $x + 10 = -4$ _____

o) $x - 3 = -20$ _____

p) $x - 13 = 10$ _____

Q2 Solve the following equations.

a) $8 + m = 4$ _____

b) $7 - m = 8$ _____

c) $5 + m = 3$ _____

d) $12 - x = 13$ _____

e) $-12 + m = -13$ _____

f) $-14 - m = -20$ _____

g) $-9 - m = 11$ _____

h) $-8 + x = 12$ _____

i) -2 - y = 16 _____

j) -7 - p = 16 _____

k) 17 - x = 18 _____

l) 19 - x = 18 _____

m) 2 - m = 7 _____

n) 7 - p = 20 _____

Q1 Solve the following equations.

a) $2x + 1 = 15$ _____

b) $2x - 1 = 15$ _____

c) $3x + 5 = 20$ _____

d) $3x + 1 = 13$ _____

e) $4x - 1 = 15$ _____

f) $2x + 7 = 11$ _____

g) $7x - 1 = 13$ _____

h) $8x + 5 = -11$ _____

i) $\dfrac{x}{2} + 1 = 4$ _____

j) $\dfrac{x}{7} - 3 = 12$ _____

k) $9x + 1 = 19$ _____

l) $\dfrac{x}{2} - 3 = 9$ _____

m) $10x - 1 = 9$ _____

n) $\dfrac{x}{7} - 2 = 5$ _____

Q2 Solve the following equations.

a) $\dfrac{x - 4}{2} = 6$ _____

b) $\dfrac{x - 7}{3} = 6$ _____

c) $-2x + 4 = 6$ _____

d) $-4x - 4 = 8$ _____

e) $-7x + 1 = -6$ _____

f) $\dfrac{x - 3}{7} = 2$ _____

g) $\dfrac{x}{7} - 11 = 2$ _____

h) $-9x - 1 = 8$ _____

i) $\dfrac{x - 11}{3} = 5$ _____

j) $\dfrac{-x - 4}{3} = -2$ _____

k) $\dfrac{-2x + 1}{7} = 3$ _____

l) $-12x + 3 = 27$ _____

| Exercise 4C | Multiplication & division of one step equations |

Q1 Solve the following equations.

a) $\dfrac{x}{8} = 2$ _____

b) $\dfrac{x}{5} = 7$ _____

c) $\dfrac{-x}{4} = 8$ _____

d) $\dfrac{x}{2} = 10$ _____

e) $\dfrac{x}{5} = -8$ _____

f) $\dfrac{x}{8} = 12$ _____

g) $\dfrac{x}{11} = -2$ ———————————————————————

h) $\dfrac{x}{13} = -2$ ———————————————————————

i) $\dfrac{x}{3} = -1$ ———————————————————————

j) $\dfrac{-x}{4} = -1$ ———————————————————————

Q2 Solve the following equations.

a) $\dfrac{p}{6} = 2$ ———————————————————————

b) $\dfrac{y}{4} = -2$ ———————————————————————

c) $\dfrac{x}{5} = -15$ ———————————————————————

d) $\dfrac{n}{8} = -3$ ———————————————————————

e) $\dfrac{m}{4} = -2$ ———————————————————————

f) $-5x = -20$ _____

g) $9x = 45$ _____

h) $7x = 56$ _____

i) $\dfrac{m}{7} = -2$ _____

j) $11x = 121$ _____

Exercise 4D   **Three step equations**

Q1 Solve the following three step equations.

a) $3x + 4 = 2x + 7$ _____

b) $6x - 10 = 4x + 12$ _____

c) $9y - 3 = 7y + 9$ _____

d) $12x - 3 = 7x + 32$ _____

e) $2 + m = 8 - 2m$ _____

f) $6m - 21 = 2m - 2$ _____

g) $4y - 2 = 2y + 12$ _____

h) $7x - 2 = 4x + 13$ _____

i) $8x - 3 = 4x + 13$ _____

j) $9p - 7 = 2p + 14$ _____

k) $10y - 5 = 5y + 15$ _____

l) $12p - 8 = 3p + 73$ _____

Q2 Solve the following equations.

a) $3x - 2 = 2x + 7$ _____

b) $4x + 3 = 3x + 12$ _____

c) $8x - 3 = 3x + 12$ _____

d) $7x + 4 = 2x + 19$ _____

e) $5x - 3 = 4x + 1$ _____

f) $9x + 3 = 8x + 7$ _____

g) $7x - 4 = 3x + 12$ _____

h) $11x - 4 = 3x + 20$ _____

i) $6x - 5 = 5x + 10$ _____

j) $7x + 6 = 12x - 19$ _____

Equations with brackets

Q1 Solve the following.

a) $2(x + 2) = 16$ _____

b) $3(x - 1) = 12$ _____

c) $4(x + 1) = 16$ _____

d) $3(x - 3) = 10$ _____

e) $2(3p + 2) = 16$ _____

f) $2(y + 5) = 18$ _____

g) $4(x - 4) = 8$ _____

h) $6(x - 1) = 24$ _____

i) $7(x + 2) = 7$ _____

j) $5(2x - 1) = 25$ _____

Solve the following equations.

a) $5(x + 4) = 4(x - 3)$ _____

b) $3(3p - 2) = 4(4 - p)$ _____

c) $9(3x - 4) = 13(2x - 1)$ _____

d) $2(5x - 10) - 9x + 6 = 0$ _____

e) $7(m - 8) = 6(m + 2)$ _____

f) $3(p - 5) = 2(p + 4)$ _____

g) $2(x + 1) + x + 3 = 0$ _____

h) $8(2x + 7) = 5(3x - 8)$ _____

i) $5(p + 3) = 4(p + q)$ _____

j) $7(x - 1) = 2(x + 9)$ _____

Exercise   4F   **Equations with fractions**

Q1 Solve the following equations.

a) $\dfrac{x}{15} = \dfrac{1}{3}$ _____   b) $\dfrac{x}{3} = \dfrac{1}{2}$ _____

c) $\dfrac{x}{5} = 1\dfrac{1}{5}$ _____

d) $\dfrac{x-2}{4} = \dfrac{1}{3}$ _____

e) $\dfrac{x+5}{7} = 2$ _____

f) $\dfrac{x+3}{3} = \dfrac{2}{5}$ _____

g) $\dfrac{p+2}{2} = 5$ _____

h) $\dfrac{p-3}{4} = 3$ _____

i) $\dfrac{5x}{3} = 7$ _____

j) $\dfrac{x}{2} + \dfrac{x}{3} = 10$ _____

Q2 Solve the following equations.

a) $\dfrac{4m}{5} - 2 = 3$ _____

b) $\dfrac{3x}{5} - 3 = 5$ _____

c) $\dfrac{2a+4}{3} = 12$ _____

d) $\dfrac{2x}{5} + 2 = 9$ _____

e) $\dfrac{2m+8}{4} = 6$ _____

f) $\dfrac{5m}{3} - 2 = 3$ _____

g) $\dfrac{3p-1}{2} = 3$ _____

h) $\dfrac{x-5}{2} = 5$ _____

i) $\dfrac{x}{4} + \dfrac{x}{6} = 2$ _____

j) $\dfrac{m}{2} - \dfrac{m}{3} = 1$ _____

Q1 Change x as the subject for the following equations.

a) $y = mx$ _____

b) $p = 2x$ _____

c) $y = mx + c$ _____

d) $y = 2x + 2$ _____

e) $y = 3x + 5$ _____

f) $p = 5q + 2x$ _____

g) $4x + 5 = y + 3$ _____

h) $y = 7p + x$ _____

i) $5y = 4x - 5$ _____

j) $7y = 6x + p$ _____

Q2 Change the letter in the brackets as the subject of the formula.

a) $u = u + at$ **(t)** _____

b) $s = ut + \dfrac{1}{2} at^2$ **(u)** _____

c) $y = mx + d$ **(x)** _____

d) $2y + x = p$ **(y)** _____

e) $y = 2x^2 + 3$ **(x)** _____

f) $y^2 + 3 = 2x$ **(x)** _____

g) $2p = x + q$ **(q)** _____

h) $5p^2 = x^2 - 3$ **(x)** _____

i) $x^2 - y = p$ **(x)** _____

j) $3x^2 + y = q$ **(x)** _____

In the following questions replace 'number' as x. Write the equation and find x.

1)   A number is doubled and 8 is added. The result is 26.

_____

2)   I think of a number, double it and the result is 12.

_____

3)   The difference between 4 times a number and 2 times a number is 22.

_____

4)   A number increased by 8 is 13.

_____

5)   The sum of a number and 7 is 20.

_____

6)   If the perimeter of an equilateral triangle is 24, what is the length of each side?

_____

7)   If I subtract 19 from a certain number the result is 12.

_____

8)   A rectangle's length is 6cm longer than its width. If its perimeter is 24, find the width
      and the length of the rectangle.

_____

9)   Peter has collected x marbles. Rose has collected 18 more marbles than Peter.

      Altogether they have 82 marbles. How much has Peter and Rose each collected?

_____

10)   Three girls had y magazines each. They gave nine magazines to another girl, but still had
      18 magazines left between them. How many magazines did each girl have?

_____

OUR PUBLICATIONS (TGL)

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	In Print	M.Nat
10	Easy Going Mathematics Year 3	Published	M.Nat
11	Easy Going English Year 3	Published	J. suki
12	Easy Going Mathematics Year 4	Published	M.Nat
13	Easy Going Verbal reasoning year 4	Published	M.Nat
14	Easy Going Non Verbal Reasoning Year 4	In Print	M.Nat
15	Easy Going English Year 4	In Print	M.Nat
16	Easy Going Maths Year 6	Published	M.Nat
17	Easy Going Maths Year 8 Maths	Published	M.Nat
18	Easy Going Maths KS4 (Y10, Y11)	published	M.Nat
19	Easy Going Maths Year 2	In Print	M.Nat
20	Year 9 Maths work book	Published	M. Nat
21	Year 7 Maths work book	In print	M. Nat
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