

Ratio, Proportion, Estimation, Upper, Lower, Rearranging, Travel, Factorising and Quadratics

Name:	Class:	Date:
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Mark	/ 40	%
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1) Simplify [2]

a) $36 : 21$

b) $42 : 49 : 77$

2) Write as a fraction in its lowest terms [1]

$35 : 55$

3) Share 18 beads between Angela and Kristen in the ratio $4 : 2$ [1]

4) A jug of orange squash is made by mixing 5 parts water to 6 parts orange concentrate. [1]

How much orange concentrate is needed to make 385 ml of orange squash?

5) A recipe requires 8 cups of flour to make 11 cookies. [1]

How many cups of flour will be needed to make 77 cookies?

6) If 1 person takes 9 days to pick the peaches from a tree, how many days will it take 9 people to do the same job?

[1]

7) If c is proportional to b and $c = 36$ when $b = 6$. Find

[1]

a) the formula for c in terms of b

b) the value of c given $b = 13$

c) the value of b given $c = 48$

8) If t is proportional to the root of s and $t = 6$ when $s = 4$. Find

[1]

a) the formula for t in terms of s

b) the value of t given $s = 25$

c) the value of s given $t = 27$

9) If z varies inversely as y^2 and $z = 9$ when $y = 3$. Find

[1]

a) the formula for z in terms of y

b) the value of z given $y = 7$

c) the value of y given $z = \frac{81}{100}$

10) Estimate the answer by rounding each number to 1 significant figure first

[2]

a)

$$385.28 + 263.14$$

b)

$$82.1 \times 98.36 \div 81.38$$

11) The number 84 has been rounded to the nearest integer. Find its lower and upper bounds. [1]

12) The number 300 has been rounded to the nearest 100. Find its lower and upper bounds. [1]

13) The number 69.7 has been rounded to the nearest 1 decimal place. Find its lower and upper bounds.

14) The number 900 has been rounded to 1 significant figure. Find its lower and upper bounds. [1]

15) Find the upper and lower bounds of $a + b$, where $a = 11$ and $b = 8$ (both have been rounded to the nearest unit).

16) Find the upper and lower bounds of $a - b$, where $a = 15$ and $b = 12$ (both have been rounded to the nearest whole number). [1]

17) Make the letter in brackets the subject of the formula [4]

a) $8y + 9v = 11T$ (y)

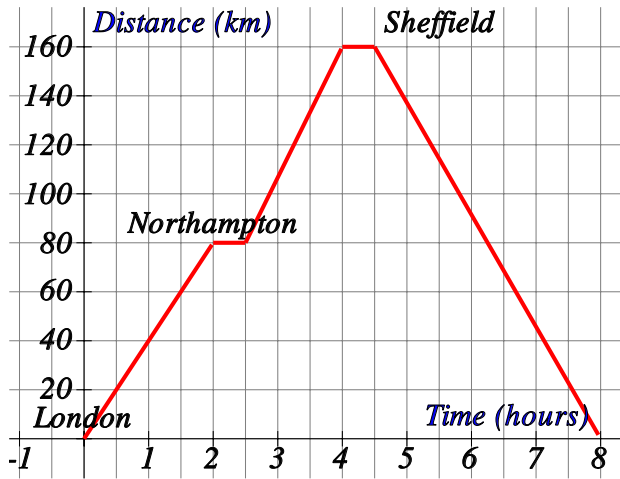
b) $9 = \frac{10t + 3}{7}$ (t)

c) $d = -r + y^2$ (y)

d)

$$mgh = \frac{1}{2}mv^2 \quad (h)$$

18) The distance-time graph below shows the journey a business man made from London to Sheffield via Northampton. (Leave answers to nearest whole number where necessary).

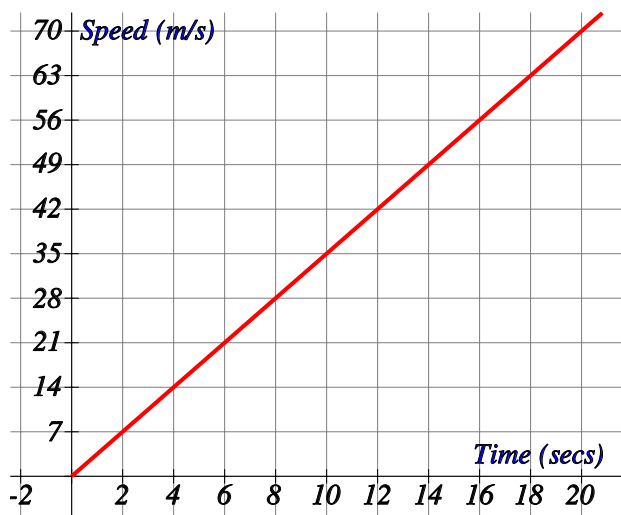


Find

- the distance to Northampton.
- the time he spent in Northampton.
- at what speed he travelled from Northampton to Sheffield.
- his average speed over the whole journey.

[1]

19) The speed-time graph below shows the acceleration of a Aston Martin DB9. Find an estimate for the acceleration leaving your answer to 1 decimal place.



20) Factorise completely

a) $18x^2 - 15x$

b) $x^2 - 5x - 36$

c) $c^2 - 49$

d) $b^2 - 14b + 49$

e) $x^2 + 12x + 27$

21) Solve the following

a) $20a^2 - 15a = 0$

b) $z^2 + 2z - 24 = 0$

c) $a^2 - 14a + 48 = 0$

d) $3z^2 - 5z - 2 = 0$

e) $2z^2 + 5z + 3 = 0$

f) $c^2 - 64 = 0$

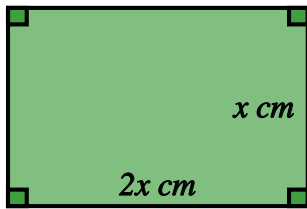
g) $16x^2 - 81 = 0$

[1]

[5]

[7]

22) The rectangle below has an area 18 cm^2 and the length is twice the width. Find the dimensions of the rectangle.



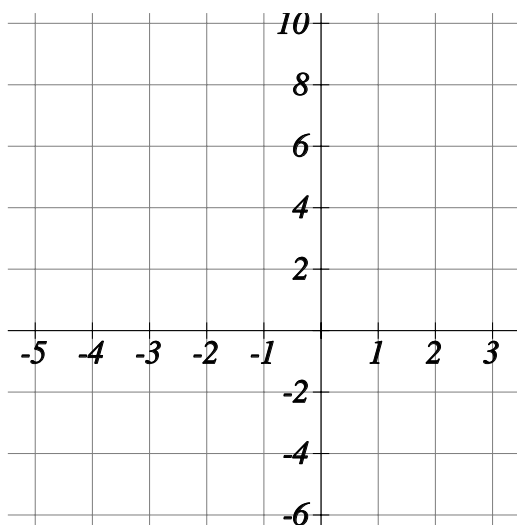
23) Solve the following, leaving your answers to 3 significant figures. [1]
[1]

$$10y^2 + 9y - 5 = 0$$

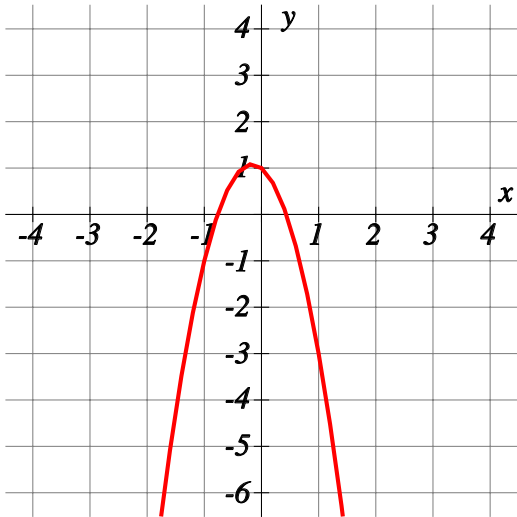
24) a) Complete the table for the equation $y = x^2 + x - 4$ [1]

x	-4	-3	-2	-1	0	1	2
x^2	16		4		0	1	
$+x$	-4	-3		-1		1	2
-4	-4	-4		-4	-4		-4
y		2			-4		

b) Draw $y = x^2 + x - 4$ on the grid below



25) Solve the quadratic equation $-3x^2 - x + 1 = 0$ using the graph of $y = -3x^2 - x + 1$ shown below. Leave your answer to 1 decimal place where necessary.



[1]

Solutions for the assessment Ratio, Proportion, Estimation, Upper, Lower, Rearranging, Travel, Factorising and Quadratics

1) a) $12 : 7$

b) $6 : 7 : 11$

2) $\frac{7}{11}$

3) Angela gets 12 beads and Kristen gets 6 beads

4) 210 ml

5) 56 cups of flour

6) 1 day

7) a) $c = 6b$ b) 78 c) 8

8) a) $t = 3\sqrt{s}$ b) 15 c) 81

9) a) $z = \frac{81}{y^2}$ b) $1\frac{32}{49}$ c) 10

10) a) $400 + 300 = 700$

b) $80 \times 100 \div 80 = 100$

Exact answer = 648.42

Exact answer = 99.2302285574

11) $83.5 \leq 84 < 84.5$

12) $250 \leq 300 < 350$

13) $69.65 \leq 69.7 < 69.75$

14) $850 \leq 900 < 950$

15) $18 \leq a + b < 20$

16) $2 \leq a - b < 4$

17) a) $y = \frac{11T - 9v}{8}$

b) $t = 6$

c) $y = \sqrt{d + r}$

d) $h = \frac{v^2}{2g}$

18) a) 80 km b) 0.5 hours

c) 53 km/h d) 40 km/h

19) 3.5 m/s^2 (3.4 - 3.6)

20) a) $3x(6x - 5)$

b) $(x + 4)(x - 9)$

c) $(c + 7)(c - 7)$

d) $(b - 7)^2$

e) $(x + 3)(x + 9)$

21) a) $a = 0$ or $a = \frac{3}{4}$

b) $z = -6$ or $z = 4$

c) $a = 8$ or $a = 6$

d) $z = -\frac{1}{3}$ or $z = 2$

e) $z = -\frac{3}{2}$ or $z = -1$

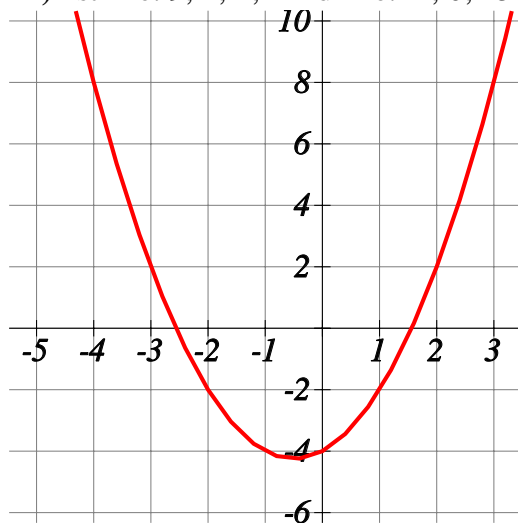
f) $c = -8$ or $c = 8$

g) $x = -\frac{9}{4}$ or $x = \frac{9}{4}$

22) Length is 6 cm and width is 3 cm

23) $y = 0.388$ or $y = -1.29$

24) 1st line: 9, 1, 4; 2nd line: -2, 0; 3rd line: -4,-4; 4th line: 8, -2, -4, -2, 2



25) $x = 0.4$ or $x = -0.8$