N5 RELATIONSHIPS 1.1

This resource is to support pupils in passing the appropriate National 5 Assessment Standard. The questions and marking schemes used are from SQA past papers and as such test the topics in their entirety from grade A to C and *may* include other areas from the course.

In addition the questions from **Paper 1 (P1)** should be completed **without** the use of a calculator and questions from **Paper 2 (P2)** permit the use of a calculator.

Each Assessment Standard is used to ensure pupils have the minimum competency on the specified sub-skills for the National 5 course. As such each Assessment Standard will test grade C work on that specific topic.

This resource is divided into two sections:

- Section A has an example on each sub skill for the relevant Assessment Standard and the marking scheme for these questions
- Section B has extra practice questions on this Assessment Standard and the marking scheme for these questions

Unit Assessment Standard	Sub skills	Section A – Question Number
Relationships 1.1 Applying algebraic skills to linear equations	determining the equation of a straight line given the gradient	Q1
	working with linear equations or inequations	Q2 (equation) Q3 (inequation)
	working with simultaneous equations	Q4
	changing the subject of a formula	Q5

FORMULAE LIST

The roots of $ax^2+bx+c=0$ are $x=\dfrac{-b\pm\sqrt{(b^2-4ac)}}{2a}$

Sine rule: $\dfrac{a}{\sin A}=\dfrac{b}{\sin B}=\dfrac{c}{\sin C}$

Cosine rule: $a^2=b^2+c^2-2bc\cos A$ or $\cos A=\dfrac{b^2+c^2-a^2}{2bc}$

Area of a triangle: $A=\frac{1}{2}ab\sin C$

Volume of a sphere: $V=\frac{4}{3}\pi r^3$

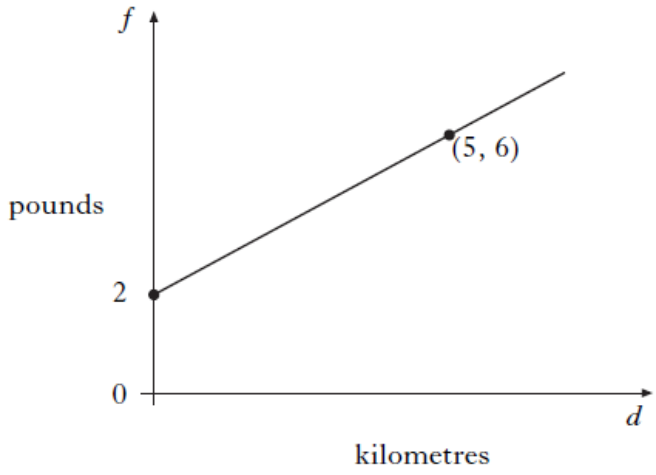
Volume of a cone: $V=\frac{1}{3}\pi r^2 h$

Volume of a pyramid: $V=\frac{1}{3}Ah$

Standard deviation: $s=\sqrt{\dfrac{\Sigma(x-\bar{x})^2}{n-1}}=\sqrt{\dfrac{\Sigma x^2-(\Sigma x)^2/n}{n-1}}$, where n is the sample size.

Section A

Section A

Q		Marks
1 P1	6. A taxi fare consists of a £2 "call-out" charge **plus** a fixed amount per kilometre. The graph shows the fare, f pounds for a journey of d kilometres.  The taxi fare for a 5 kilometre journey is £6. Find the equation of the straight line in terms of d and f.	4 (2.1)
2 P1	4. Solve the equation $$3x+1=\frac{x-5}{2}.$$	3
3 P1	(*b*) Solve the inequality $$4x-5 \leq 7x-20.$$ 7.	3
4 P1	11. (*a*) A cinema has 300 seats which are either standard or deluxe. Let x be the number of standard seats and y be the number of deluxe seats. Write down an algebraic expression to illustrate this information. (*b*) A standard seat costs £4 and a deluxe seat costs £6. When all the seats are sold the ticket sales are £1380. Write down an algebraic expression to illustrate this information. (*c*) How many standard seats and how many deluxe seats are in the cinema?	1 (2.1) 2 (2.1) 3 (2.2)

5 P1	**4.** $P = \frac{2(m-4)}{3}$ Change the subject of the formula to m.	3

Section A

MARKING SCHEME

Section A - Marking Scheme

1

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
6	Ans: $f=\frac{4}{5}d+2$	
	• gradient	• $\frac{4}{5}$
	• y-intercept	• $+2$
	• linear equation	• $y=\frac{4}{5}x+2$
	• equation in terms of d and f	• $f=\frac{4}{5}d+2$
		4KU

Notes:

(i) for a correct equation without working — award $\frac{4}{4}$

(ii) where the gradient and/or y-intercept are wrong, but explicitly stated, the 3rd and 4th marks are still available

(iii) for an answer of $f=\frac{4}{5}d$ — award $\frac{2}{4}$

(unless the y-intercept has been explicitly stated as zero, in which case, award $\frac{3}{4}$)

(iv) for an answer of $f=\frac{4}{5}d+c$ — award $\frac{2}{4}$

(v) an equation involving transposition of f and d may be awarded a maximum of $\frac{3}{4}$

2

4	Ans: $-\frac{7}{5}$	
	• starting to solve equation	• $6x+2=x-5$
	• collecting like terms	• $5x=-7$
	• solution	• $x=-\frac{7}{5}$
		3KU

3

7	b		Solve the inequality $4x - 5 \leq 7x - 20$ **Ans:** $x \geq 5$ **or** $5 \leq x$ •[1] dealing with variable •[2] dealing with constant •[3] solution	**3** **(KU)**	•[1] $-3x$ or $3x$ •[2] -15 or 15 •[3] $x \geq 5$ or $5 \leq x$

4

11 (a)	**Ans:** $x + y = 300$ • equation	• $x + y = 300$ **1KU**
Notes:		
(b)	**Ans:** $4x + 6y = 1380$ • terms • equation	• $4x$ and $6y$ • $4x + 6y = 1380$ **2KU**
Notes:		
(c)	**Ans: 210 standard and 90 deluxe** • evidence of scaling • value of x • value of y	• $4x + 4y = 1200$ or equivalent • 210 • 90 **3RE**
Notes: (i) for 90 and 210 without working — award $\frac{0}{3}$ (ii) for 90 and 210 verified in **both** equations — award $\frac{1}{3}$		

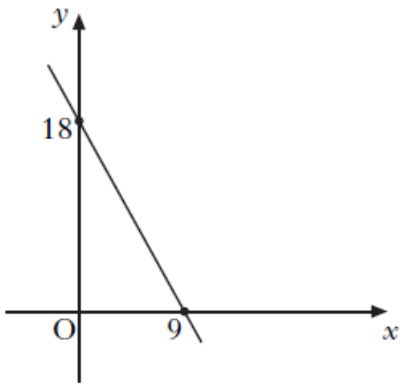
5

4	**Ans:** $m = \frac{3P+8}{2}$ **or** $m = \frac{3P}{2}+4$ **Method 1:** • dealing with denominator • dealing with constant • dealing with coefficient **Method 2:** • dealing with denominator • dealing with coefficient • dealing with constant	 • $3P$ • $3P+8=2m$ • $\frac{3P+8}{2}$ • $3P$ • $\frac{3P}{2}=m-4$ • $\frac{3P}{2}+4$ **3KU**
Notes:		

Section B

Section B

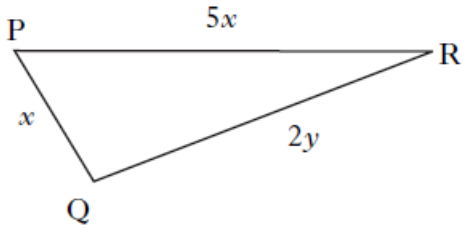
Paper 1 Questions

Q		Marks
1	3. $W = BH^2$. Change the subject of the formula to H.	2
2	4. A straight line cuts the x-axis at the point $(9, 0)$ and the y-axis at the point $(0, 18)$ as shown.  Find the equation of this line.	3
3	6. Jane enters a two-part race. (a) She cycles for 2 hours at a speed of $(x + 8)$ kilometres per hour. Write down an expression in x for the distance cycled. (b) She then runs for 30 minutes at a speed of x kilometres per hour. Write down an expression in x for the distance run. (c) The **total** distance of the race is 46 kilometres. Calculate Jane's **running** speed.	1 (2.1) 1 (2.1) 3 (2.2)

4

8. In triangle PQR:

- PQ = x centimetres
- PR = $5x$ centimetres
- QR = $2y$ centimetres.



(a) The perimeter of the triangle is 42 centimetres.

Write down an equation in x and y to illustrate this information. — 2 (2.1)

(b) PR is 2 centimetres longer than QR.

Write down another equation in x and y to illustrate this information. — 2 (2.1)

(c) Hence calculate the values of x and y. — 3

5

9. A formula used to calculate the flow of water in a pipe is

$$f = \frac{kd^2}{20}.$$

Change the subject of the formula to d. — 3

6

3. Change the subject of the formula to s. — 3

$$t = \frac{7s+4}{2}.$$

7

7. A straight line has equation $y = mx + c$, where m and c are constants.

(*a*) The point (2, 7) lies on this line.

Write down an equation in m and c to illustrate this information. — 1 (2.1)

(*b*) A second point (4, 17) also lies on this line.

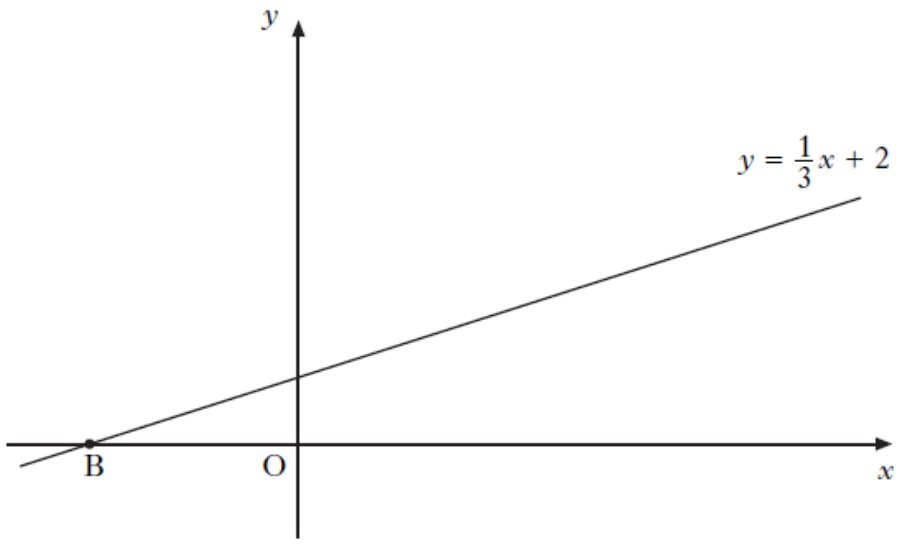
Write down another equation in m and c to illustrate this information. — 1 (2.1)

(*c*) Hence calculate the values of m and c. — 3

(*d*) Write down the gradient of this line. — 1 (2.2)

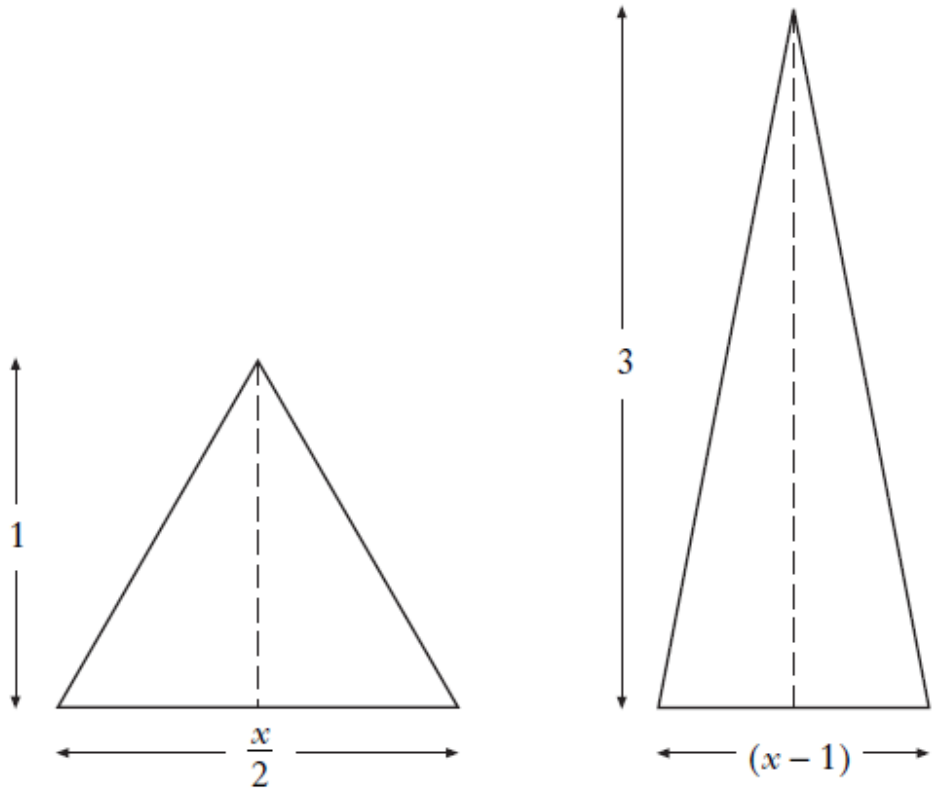
8

9. Part of the graph of the straight line with equation $y = \frac{1}{3}x + 2$, is shown below.



(*a*) Find the coordinates of the point B. — 2 (2.1)

(*b*) For what values of x is $y < 0$? — 1

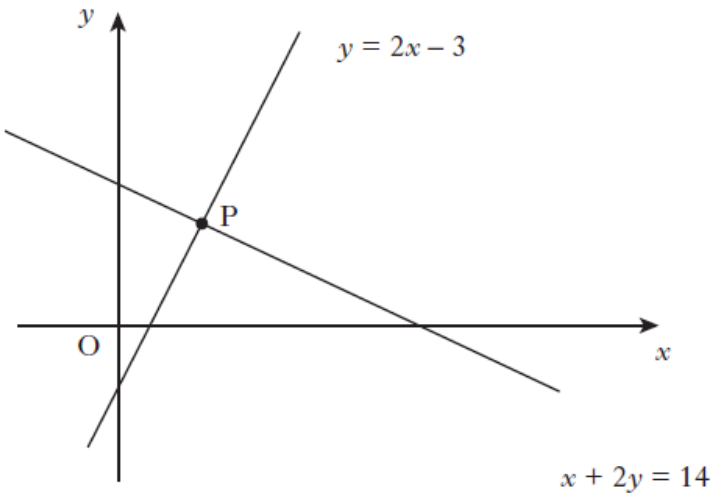
9	**11.** Two triangles have dimensions as shown.  The triangles are equal in area. **Calculate** the value of x.	4 (2.1) (2.2)

10	7. (*a*) Brian, Molly and their four children visit Waterworld. The total cost of their tickets is £56.  Let a pounds be the cost of an adult's ticket and c pounds the cost of a child's ticket. Write down an equation in terms of a and c to illustrate this information. (*b*) Sarah and her three children visit Waterworld. The total cost of their tickets is £36. Write down another equation in terms of a and c to illustrate this information. (*c*) (i) Calculate the cost of a child's ticket. (ii) Calculate the cost of an adult's ticket.	1 (2.1) 1 (2.1) 2 (2.2) 1 (2.2)
11	3. Change the subject of the formula to m. $$L = \frac{\sqrt{m}}{k}$$	2

12

8. The graph below shows two straight lines.

- $y = 2x - 3$
- $x + 2y = 14$



The lines intersect at the point P.

Find, **algebraically**, the coordinates of P. 4

13

9. Each day, Marissa drives 40 kilometres to work.

(*a*) On Monday, she drives at a speed of x kilometres per hour.

Find the time taken, in terms of x, for her journey. 1 (2.1)

(*b*) On Tuesday, she drives 5 kilometres per hour **faster**.

Find the time taken, in terms of x, for this journey. 1 (2.1)

(*c*) Hence find an expression, in terms of x, for the difference in times of the two journeys.

Give this expression **in its simplest form**. 3

14

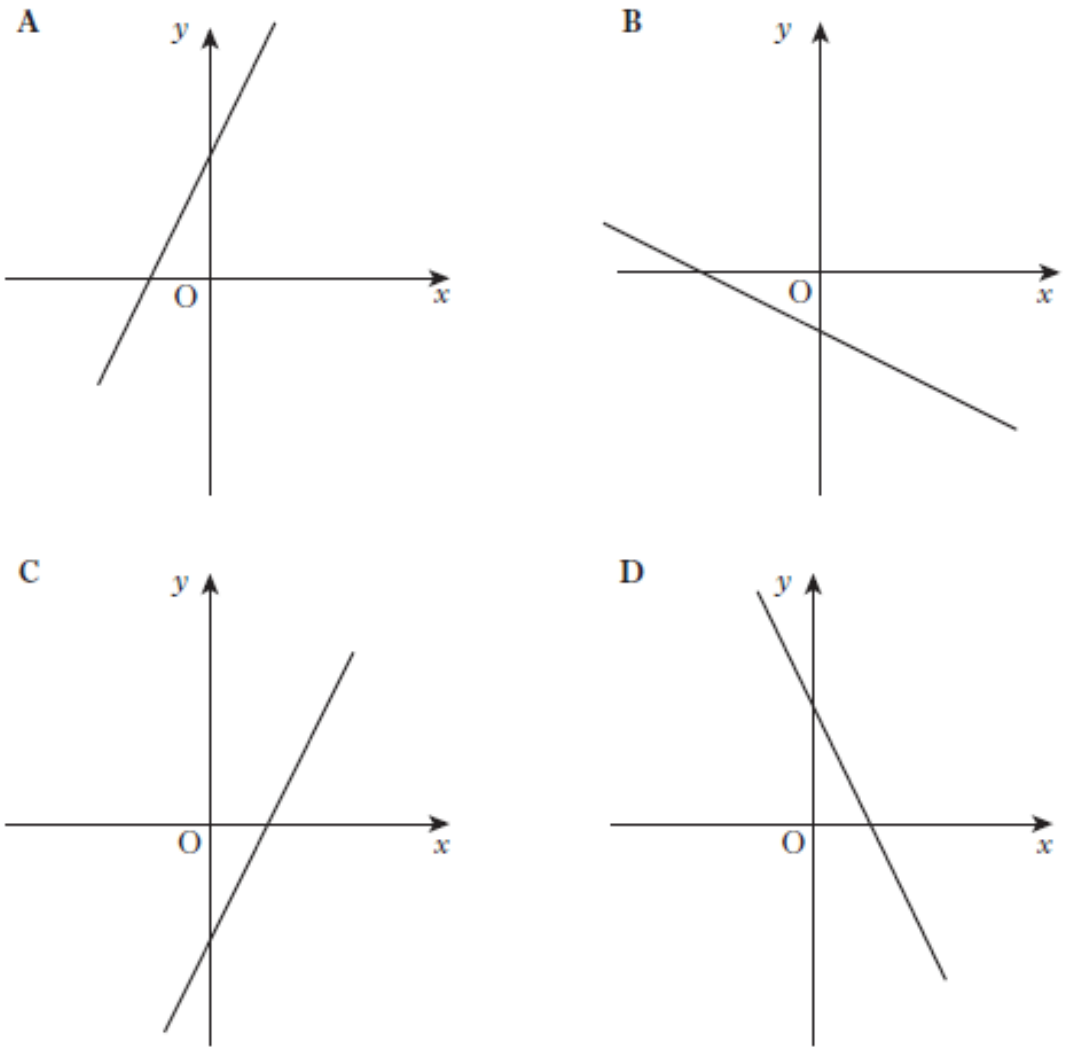
4. Change the subject of the formula to r. 2

$$A = 4\pi r^2.$$

15	**6.** Joan buys gold and silver charms to make bracelets. 2 gold charms and 5 silver charms cost £125. (*a*) Let g pounds be the cost of one gold charm and s pounds be the cost of one silver charm. Write down an equation in terms of g and s to illustrate the above information. 4 gold charms and 3 silver charms cost £145. (*b*) Write down another equation in terms of g and s to illustrate this information. (*c*) Hence calculate the cost of each type of charm.	1 (2.1) 1 (2.1) 3 (2.2)

16

8. Four straight line graphs are shown below.



Which one of these above could represent the line with equation $2x + y = 3$?

Give two reasons to justify your answer.

3

17

9. Quick-Smile photographers charge the following rates:

- 50p per photograph for the first 12 photographs printed
- 35p per photograph for any further photographs printed
- £4·25 for a CD of the photographs.

(*a*) How much will it cost to have 16 photographs printed plus a CD?

2

(*b*) Find a formula for C, the cost in pounds, of having x photographs printed (where x is greater than 12) plus a CD.

3
(2.1)

18	11. (a) A straight line has equation $4x+3y=12$. Find the gradient of this line.	2

Paper 2 Questions

Q		Marks
19	**4.** Solve the inequality $$\frac{x}{4}-\frac{1}{2}<5.$$	2
20	**4.** Aaron saves 50 pence and 20 pence coins in his piggy bank.  Let x be the number of 50 pence coins in his bank. Let y be the number of 20 pence coins in his bank. (*a*) There are 60 coins in his bank. Write down an equation in x and y to illustrate this information. (*b*) The total value of the coins is £17·40. Write down another equation in x and y to illustrate this information. (*c*) Hence find **algebraically** the number of 50 pence coins Aaron has in his piggy bank.	1 (2.1) 1 (2.1) 3 (2.2)

21

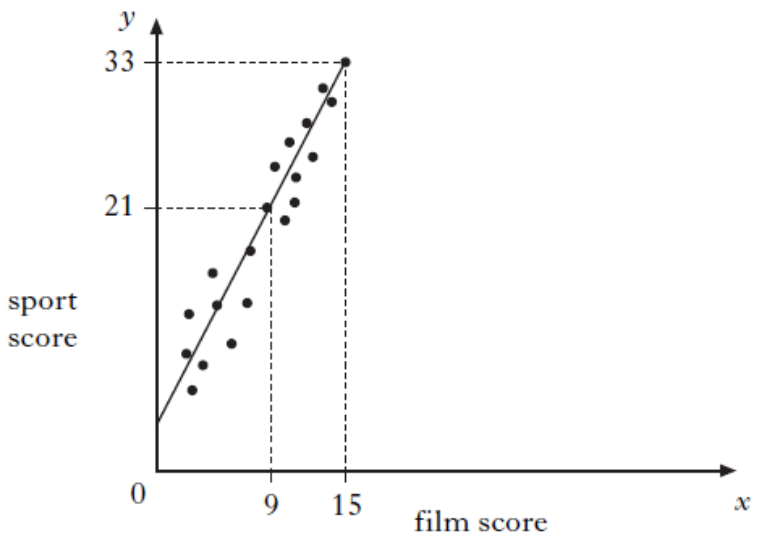
10. To hire a car costs £25 per day plus a mileage charge.
The first 200 miles are free with each additional mile charged at 12 pence.

(*a*) Calculate the cost of hiring a car for 4 days when the mileage is 640 miles. — 1

(*b*) A car is hired for d days and the mileage is m miles where $m > 200$.
Write down a formula for the cost £C of hiring the car. — 3 (2.1)

22

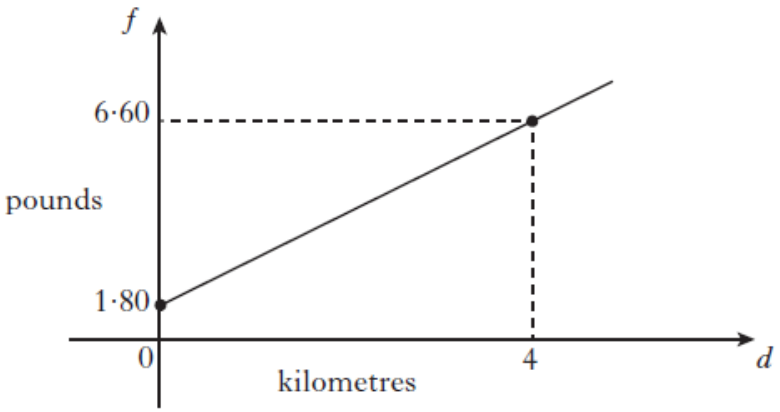
6. Teams in a quiz answer questions on film and sport.
This scatter graph shows the scores of some of the teams.



A line of best fit is drawn as shown above.

(*a*) Find the equation of this straight line. — 4

(*b*) Use this equation to estimate the sport score for a team with a film score of 20. — 2 (2.1) (2.2)

23	**10.** Tom and Samia are paid the same hourly rate. Harry is paid $\frac{1}{3}$ more per hour than Tom. Tom worked 15 hours, Samia worked 8 hours and Harry worked 12 hours. They were paid a total of £429. How much was Tom paid?	3 (2.1) (2.2)
24	**10.** A taxi fare consists of a call-out charge of £1·80 **plus** a fixed cost per kilometre. A journey of 4 kilometres costs £6·60. The straight line graph shows the fare, f pounds, for a journey of d kilometres.  (*a*) Find the equation of the straight line. (*b*) Calculate the fare for a journey of 7 kilometres.	3 2 (2.1) (2.2)

25	3. Two groups of people go to a theatre. Bill buys tickets for 5 adults and 3 children. The total cost of his tickets is £158·25. (a) Write down an equation to illustrate this information. (b) Ben buys tickets for 3 adults and 2 children. The total cost of his tickets is £98. Write down an equation to illustrate this information. (c) Calculate the cost of a ticket for an adult and the cost of a ticket for a child.	1 (2.1) 1 (2.1) 4 (2.2)
26	11. Change the subject of the formula $s = ut + \frac{1}{2}at^2$ to a.	3

Section B

MARKING SCHEME

Section B – Marking Scheme

Marking Scheme

Paper 1

Q				Marks
1	3	**Ans:** $H=\sqrt{\frac{W}{B}}$ • beginning to rearrange • completed rearrangement	• $H^2=\frac{W}{B}$ • $H=\sqrt{\frac{W}{B}}$ **2KU**	

Notes:

(i) for $H=\sqrt{\frac{W}{B}}$, with or without working — award $\frac{2}{2}$

(ii) for $H=\frac{\sqrt{W}}{B}$, with or without working — award $\frac{1}{2}$

(iii) the 2nd mark is for the square root of the candidate's expression for H^2

2

4	**Ans:** $y = -2x + 18$ • gradient • y-intercept • linear equation	 • -2 • 18 • $y = -2x + 18$ **3KU**

Notes:

(i) for $y = -2x + 18$, with or without working — award $\frac{3}{3}$

(ii) for $y = -2x + c$, with or without working — award $\frac{1}{3}$

(iii) for $y = mx + 18$, with or without working — award $\frac{1}{3}$

(iv) for an incorrect equation, the 3rd mark can be awarded only if both gradient **and** y-intercept are consistent with stated values

3

6 (a)	**Ans:** $2(x + 8)$ • expression	 • $2(x + 8)$ **1KU**
(b)	**Ans:** $0.5x$ • expression	 • $0.5x$ **1KU**
(c)	**Ans: 12 kilometres per hour** • equating the two distances • collecting like terms • solution	 • $2(x + 8) + 0.5x = 46$ • $2.5x = 30$ • $x = 12$ **3RE**

Notes:

(i) for answer of 12 km/h **without** working — award $\frac{1}{3}$

4

8 (a)	**Ans:** $6x+2y=42$ • starting to form equation • equation	• $x+5x+2y$ • $x+5x+2y=42$ **2KU**
NOTES:		
(b)	**Ans:** $5x-2y=2$ • starting to form equation • equation	• an equation containing only the terms $5x$, $2y$ and 2 • $5x-2y=2$ **2RE**
NOTES:		
(c)	**Ans:** $x=4, y=9$ • method • processing • processing	• $11x=44$ or equivalent • $x=4$ • $y=9$ **3RE**
NOTES: (i) for 4 and 9 verified in **both** equations award 1/3		

5		9	**Ans:** $d = \sqrt{\frac{20f}{k}}$ • beginning to rearrange • continuing rearrangement • completed rearrangement	• $kd^2 = 20f$ • $d^2 = \frac{20f}{k}$ • $d = \sqrt{\frac{20f}{k}}$ **3KU**		
		NOTES: (i) for $d = \sqrt{\frac{20f}{k}}$, with or without working — award 3/3 (ii) for $d = \frac{\sqrt{20f}}{k}$, with or without working — award 2/3 (iii) the 3rd mark is for the square root of the candidate's expression for d^2				
6		3	**Ans:** $s = \frac{2t-4}{7}$ • beginning to rearrange • continuing to rearrange • completed rearrangement	• $7s + 4 = 2t$ • $7s = 2t - 4$ • $s = \frac{2t-4}{7}$ **3KU**		

7

7 (a)	Ans: $2m + c = 7$ • equation	• $2m + c = 7$ 1KU
(b)	Ans: $4m + c = 17$ • equation	• $4m + c = 17$ 1KU
NOTES: (i) marks can only be awarded for equations in terms of m and c		
(c)	Ans: $m = 5, c = -3$ • method • value of m • value of c	• $2m = 10$ or similar • 5 • -3 3RE
NOTES: (i) accept alternative methods eg $m = \frac{17-7}{4-2}$ or graphical solution		
(d)	Ans: 5 • gradient	• 5 1RE
NOTES: (i) the final mark is awarded for either the correct gradient (5) or the value of m from part (c)		

8

9 (a)	**Ans:** $B(-6, 0)$ • starting to solve • coordinates of B	 • $\frac{1}{3}x + 2 = 0$ • $(-6, 0)$ **2KU**

NOTES:

(i) for $(-6, 0)$ with or without working — award 2/2

(ii) for $(0, -6)$ with or without working — award 1/2

(iii) answer must be in co-ordinate form

(b)	**Ans:** $x < -6$ • solution	 • $x < -6$ **1RE**

9

11	**Ans:** $x = \frac{6}{5}$ • strategy • forming a valid equation • starting to solve • solution	 • $\frac{1}{2} \times 1 \times \frac{x}{2}$ or $\frac{1}{2} \times 3 \times (x-1)$ • $\frac{1}{2} \times 1 \times \frac{x}{2} = \frac{1}{2} \times 3 \times (x-1)$ • $x = 6(x-1)$ • $x = \frac{6}{5}$ **4RE**

NOTES:

(i) areas need not be explicitly stated

(ii) for $1 \times \frac{x}{2} = 3(x-1)$ award the first two marks

(iii) for $1 \times \frac{x}{2} = 3(x-1)$ arising from Area of Triangle $= b \times h$, the first two marks cannot be awarded

10		**7 (a)**	**Ans:** $2a + 4c = 56$ • correct equation	• $2a + 4c = 56$ **1KU**		
		(b)	**Ans:** $a + 3c = 36$ • correct equation	• $a + 3c = 36$ **1KU**		
		(c)	**Ans:** **£8 and £12** • evidence of scaling • processing • processing	• $2a + 6c = 72$ or equivalent • $c = 8$ or $a = 12$ • second value **3RE**		
		NOTES: Trial/Error method: 1st mark not available 2nd mark for $c = 8$ and $a = 12$ 3rd mark for verification of $c = 8$ and $a = 12$ in BOTH equations				
11	**3**	**Ans:** $m = (kL)^2$ • beginning to rearrange • completed rearrangement	• $\sqrt{m} = kL$ • $m = (kL)^2$ or k^2L^2 **2KU**			

12		8	**Ans: (4,5)** **Method 1** • re-arranging terms • evidence of scaling • one value • coordinates	• $2y=-x+14$ • $4y=-2x+28$ • $y=5$ • (4,5) **4KU**		
			Ans: (4,5) **Method 2** • substitution • simplifying • one value • coordinates	• $x+2(2x-3)=14$ • $5x-6=14$ • $x=4$ • (4,5) **4KU**		
		NOTES: (i) for (4, 5) without working but checked in **both** equations — award 1/4 (ii) for (4, 5) without either working or checking — award 0/4 (iii) The final mark is available only for an answer in coordinate form				

13

9 (a)	**Ans:** $\frac{40}{x}$ • statement of time	• $(T=)\frac{40}{x}$ **1KU**
(b)	**Ans:** $\frac{40}{x+5}$ • statement of time	• $(T=)\frac{40}{x+5}$ **1RE**
(c)	**Ans:** $\frac{200}{x(x+5)}$ • strategy • common denominator • simplified expression	• $\frac{40}{x}-\frac{40}{x+5}$ • $\frac{\ldots}{x(x+5)}-\frac{\ldots}{x(x+5)}$ • $\frac{200}{x(x+5)}$ **3RE**

NOTES:

(i) A candidate who writes $\frac{40}{x+5}-\frac{40}{x}$ gains the first mark

(ii) The final mark may be awarded for $\frac{-200}{x(x+5)}$ if it leads to $\frac{200}{x(x+5)}$

14

15

6	a		Joan buys gold and silver charms to make bracelets. 2 gold charms and 5 silver charms cost £125. Let g pounds be the cost of one gold charm and s pounds be the cost of one silver charm. Write down an equation in terms of g and s to illustrate the above information. **Ans: $2g + 5s = 125$** $\bullet^1$ process	1 (KU)	$\bullet^1$ $2g + 5s = 125$
6	b		4 gold charms and 3 silver charms cost £145. Write down another equation in terms of g and s to illustrate this information. **Ans: $4g + 3s = 145$** $\bullet^1$ process	1 (KU)	$\bullet^1$ $4g + 3s = 145$
6	c		Hence calculate the cost of each type of charm. **Ans: $g = 25$; $s = 15$** $\bullet^1$ starting process $\bullet^2$ value of one variable $\bullet^3$ value of a second variable	3 (RE)	$\bullet^1$ evidence of scaling $\bullet^2$ $g = 25$ $\bullet^3$ $s = 15$

Notes:

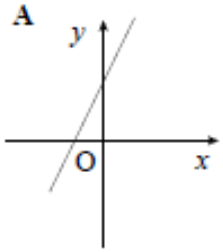
(i) for $g = 25$ and $s = 15$ without working **but checked in both equations** award 1/3

(ii) for $g = 25$ and $s = 15$ without working award 0/3

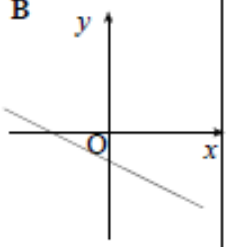
16

8 Four straight line graphs are shown below.

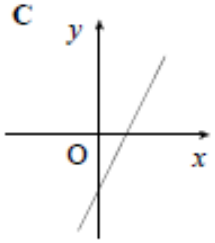
A



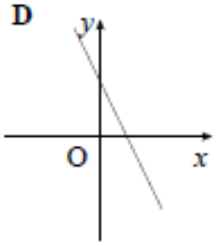
B



C



D



Which one of these above could represent the line with equation $2x + y = 3$?

Give two reasons to justify your answer.

Ans: graph D — **3**

•1	re-arranging	•1	$y = -2x + 3$
•2	understanding	•2	m – negative c – positive
•3	conclusion	•3	D

(RE)

Notes:

(i) for an answer with no working — award 0/3

(ii) for candidates who do not re-arrange, the 1st mark can be awarded only if the correct gradient and intercept are stated

17

9	a		Quick-Smile photographers charge the following rates: • 50p per photograph for the first 12 photographs printed • 35p per photograph for any further photographs printed • £4·25 for a CD of the photographs. How much will it cost to have 16 photographs printed plus a CD? **Ans: £11·65**	**2** (KU)	•¹ either (12 × 0·5)….. + 4·25 or (16 – 12) × 0·35 •² £11·65

Notes:

(i) for £11·65 with/without working award 2/2

(ii) the 2nd mark may be awarded **only** for a correct calculation involving all 3 rates.

9	b		Find a formula for C, the cost in pounds, of having x photographs printed (where x is greater than 12) plus a CD. **Ans: (c =) 6 + (x-12) 0·35 + 4·25**	**3** (RE)	•¹ 12 × 0·5 •² $(x – 12) \times 0·35$ •³ $6 + (x – 12)\ 0·35 + 4·25$

Notes:

(i) ignore subsequent simplification

(ii) candidates may work in pence, but final answer must be in pounds

18

Question	Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
11. (a)	Ans: gradient $= -\frac{4}{3}$ •[1] start to rearrange •[2] state gradient	2	 •[1] $3y = -4x + 12$ •[2] $-\frac{4}{3}$

Notes:

1. Correct answer without working award 2/2
2. Some common answers (no working necessary)

(a) $-1\dot{3}$, $-1{\cdot}33$ award 2/2

(b) $-1{\cdot}3$ award 1/2

(c) $-\frac{4}{3}x$ award 1/2

(d) $\frac{4}{3}$ award 1/2

(e) $\frac{4}{3}x$ award 0/2

Paper 2

Q 19

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark
4	**Ans:** $x < 22$ • dealing with denominator or constant • solution	• $x - 2 < 20$ or $\frac{x}{4} < 5\frac{1}{2}$ • $x < 22$ **2K**
Notes:		

20

4 (a)	**Ans:** $x + y = 60$ • equation	• $x + y = 60$ **1KU**	
(b)	**Ans:** $50x + 20y = 1740$ • equation	• $50x + 20y = 1740$ **1KU**	
(c)	**Ans: 18 fifty pence coins** • evidence of scaling • processing • value of x	• $20x + 20y = 1200$ or equivalent • $30x = 540$ or equivalent • 18 **3RE**	
Notes: (i) for 18 without working — award $\frac{0}{3}$ (ii) for 18 and 42 verified in **both** equations — award $\frac{1}{3}$			

Marks

21

10 (a)	**Ans: £152.80**	
	• solution	• 152.80 **1KU**
(b)	**Ans: $C = 25d + 0.12m - 24$**	
	• starting formula	• $25d$
	• continuation	• $0.12m$
	• formula	• $C = 25d + 0.12m - 24$ or $C = 25d + 0.12(m - 200)$ **3RE**

22

6 (a)	**Ans: $y = 2x + 3$**	
	• gradient	• 2
	• y-intercept	• $(c =)3$
	• gradient or intercept in equation	• $y = 2x\cdots$ or $y = \cdots + 3$
	• linear equation	• $y = 2x + 3$ **4KU**

Notes:

(i) for a correct equation without working award 4/4

(ii) where the gradient and/or y-intercept are wrong, but explicitly stated, the 3rd and 4th marks are still available

(b)	**Ans: 43**	
	• substitution	• $2 \times 20 + 3$
	• evaluation	• 43 **2RE**

Notes:

(i) for 43 with or without working award 2/2

23	**10**	**Ans: £165**	
		• Valid strategy involving $\frac{1}{3}$	• $12 + \frac{1}{3}(12)$ or $x + \frac{1}{3}x$
		• Creating an equation	• $15 + 8 + 16 = 39$ **Or** • $15x + 8x + 12\left(\frac{4}{3}x\right) = 39x$
		• solution	• $\frac{429}{39} \times 15 = £165$
			3KU

NOTES:

(i) the final mark is for obtaining an hourly rate × 15

eg $15 + 8 + 12 = 35$

$\frac{429}{35} \times 15 = £183{\cdot}86$ award 1/3

24

10 (a)	**Ans:** $f = 1{\cdot}2d + 1{\cdot}8$ • gradient • y-intercept • linear equation	 • $1{\cdot}2$ • $1{\cdot}8$ • $f = 1{\cdot}2d + 1{\cdot}8$ **3KU**

NOTES:

(i) for a correct equation without working — award 3/3

(ii) where the gradient and/or y-intercept are wrong, but explicitly stated, the 3rd mark is still available

(b)	**Ans:** **£10·20** • substitution • evaluation	 • $1{\cdot}2 \times 7 + 1{\cdot}8$ • $10{\cdot}2(0)$ **2RE**

NOTES:

(i) for $10{\cdot}2(0)$ with or without working — award 2/2

25

Question			Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
3.	(a)		Ans: $5a + 3c = 158{\cdot}25$ •[1] construct equation	1	 •[1] $5a + 3c = 158{\cdot}25$
Notes: 1. Accept variables other than a and c.					
	(b)		Ans: $3a + 2c = 98$ •[1] construct equation	1	 •[1] $3a + 2c = 98$
Notes:					
	(c)		Ans: Adult ticket costs £22·50 Child ticket costs £15·25 •[1] evidence of scaling •[2] follow a valid strategy through to produce values for a and c •[3] calculate correct values for a and c •[4] communicate answers in money	4	 •[1] eg $\begin{matrix}10a+6c=316{\cdot}50\\9a+6c=294\end{matrix}$ •[2] values for a and c •[3] $a = 22{\cdot}5$ and $c = 15{\cdot}25$ •[4] Adult £22·50 Child £15·25
Notes: 1. The fourth mark may only be awarded when all of the following are given in the final answer: the words "adult" and "child", the £ signs and both amounts written with two decimal figures.					

26

Question			Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
11.			Ans: $a = \dfrac{2(s-ut)}{t^2}$ •[1] subtract ut •[2] multiply by 2 •[3] divide by t^2	3	 •[1] $s-ut = \dfrac{1}{2}at^2$ •[2] $2(s-ut) = at^2$ •[3] $a = \dfrac{2(s-ut)}{t^2}$
Notes: 1. Correct answer without working — award 3/3 2. For subsequent incorrect working, the final mark is not available. 3. For $a = \dfrac{s-ut}{\frac{1}{2}t^2}$ — award 2/3					