Yr 11 PRM work

Question 1

A sketch of $2x + 3y = 12$ is shown.
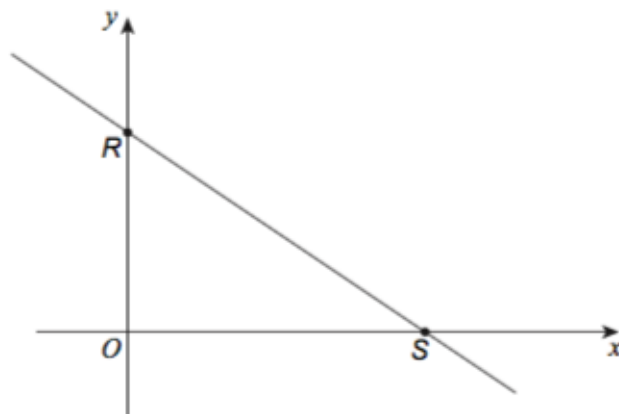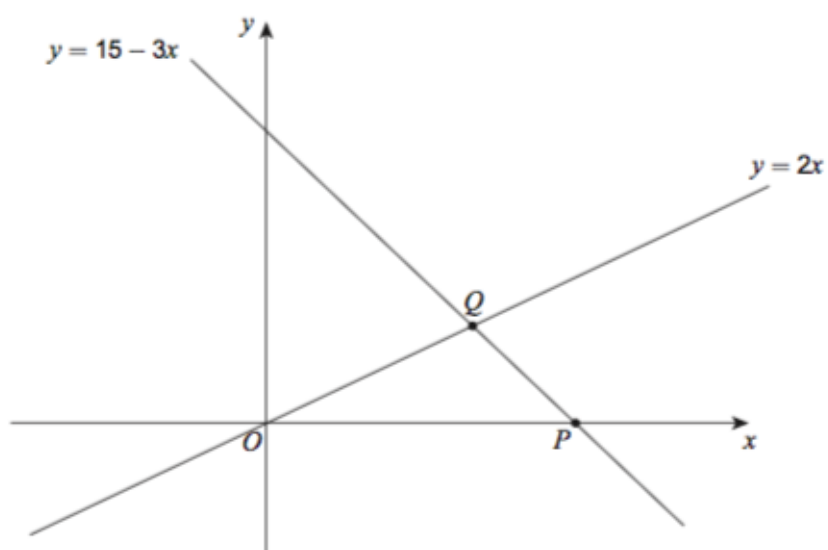

Work out the coordinates of R.

....

(1 mark)

Question 2

The sketch graphs of two straight lines are shown.

Work out the coordinates of P.

....

(1 mark)

Question 3

A straight line with equation $y = mx + c$ has gradient m and y-intercept c.

Here are the equations of four straight lines, P, Q, R and S.

P $2y - 4x = 5$

Q $5y = 2x - 4$

R $2y - 4 = 5x$

S $4y = 5 - 2x$

Select the line that passes through $(7,2)$

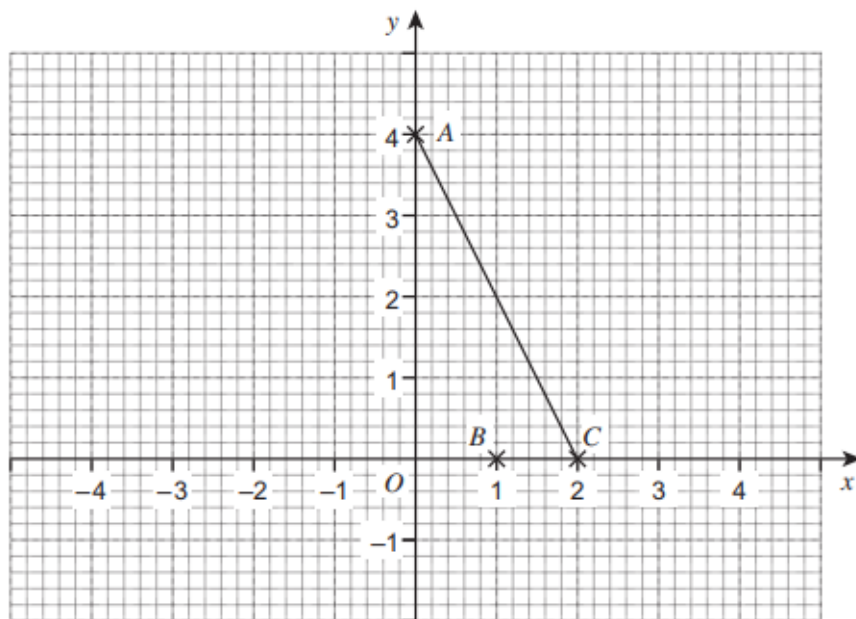[   ] P

[   ] Q

[   ] R

[   ] S

(1 mark)

Question 4

Write down the equation of the straight line that

passes through the point $(0,4)$

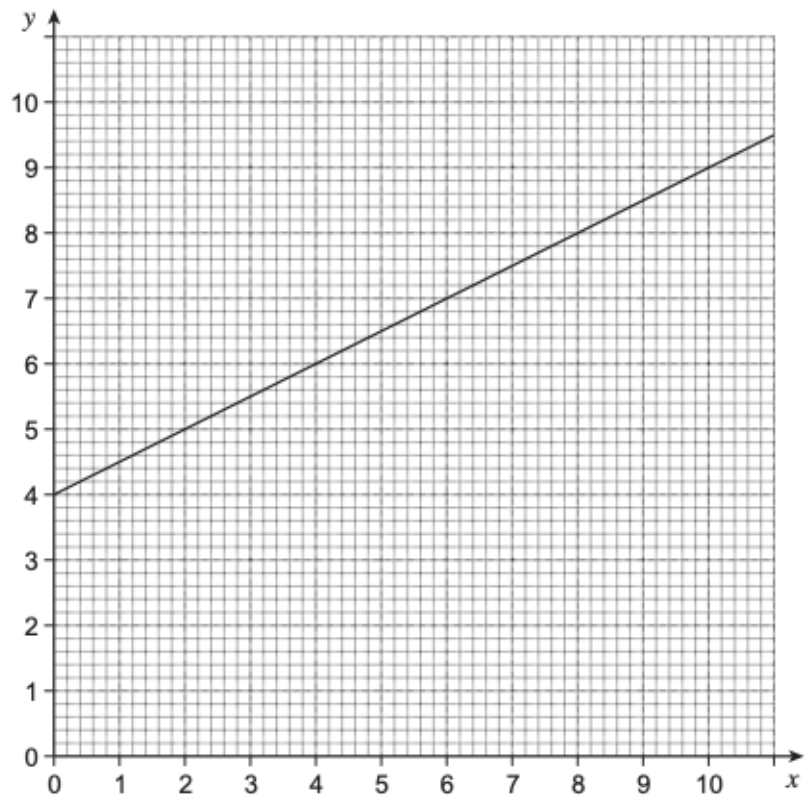**and**

is parallel to the line $y = 5x + 3$.

....

(2 marks)

Question 5

Find an equation of the line through B parallel to AC.

....

Question 6

Work out the equation of the line shown.

....

(3 marks)

Question 7

A straight line has gradient -2 and passes through the point $(-3,10)$.

Work out the equation of the line.

Give your answer in the form $y = mx + c$

....

(2 marks)

Question 8

Work out the equation of the straight line that passes through the points $(2,0)$ and $(0,-4)$.

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....

(3 marks)

Question 9

Select the two equations that are equivalent to $2y = 3x + 4$

[   ] $2x = 3y + 4$

[   ] $y - \frac{3}{2}x = 2$

[   ] $y = \frac{3}{2}x + 4$

[   ] $3x - 2y + 4 = 0$

(2 marks)

Question 10

Determine the distance between $A(-5, -4)$ and $B(-7, -1)$, giving your answer as an **exact value**.

....

Question 11

Determine the distance between $A(2, -3)$ and $B(3,2)$, giving your answer as an **exact value**.

....

Question 12

Determine the distance between $P(-1,1)$ and $Q(1,-1)$, giving your answer as an **exact value**.

....

Question 13

The diagram shows the graph of $y = 3x + c$, where c is a constant.
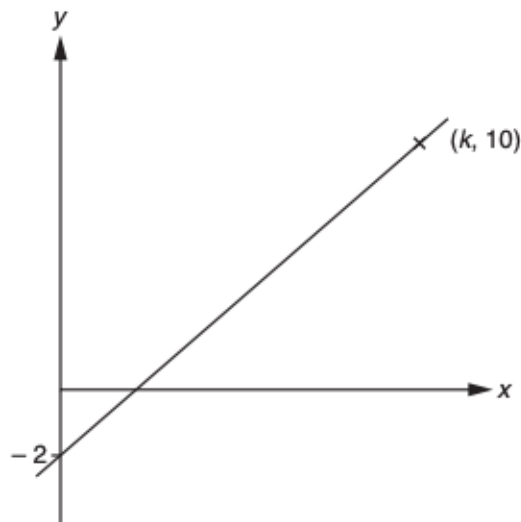
Find the value of k.

....

(3 marks)

Question 14

In which region would the line represented by the equation $y = \frac{2}{3}x + 2$ be in the following Venn diagram?

A

B

Gradient is 1

C

E

D

y-intercept is 2

F

H

G

Region ....
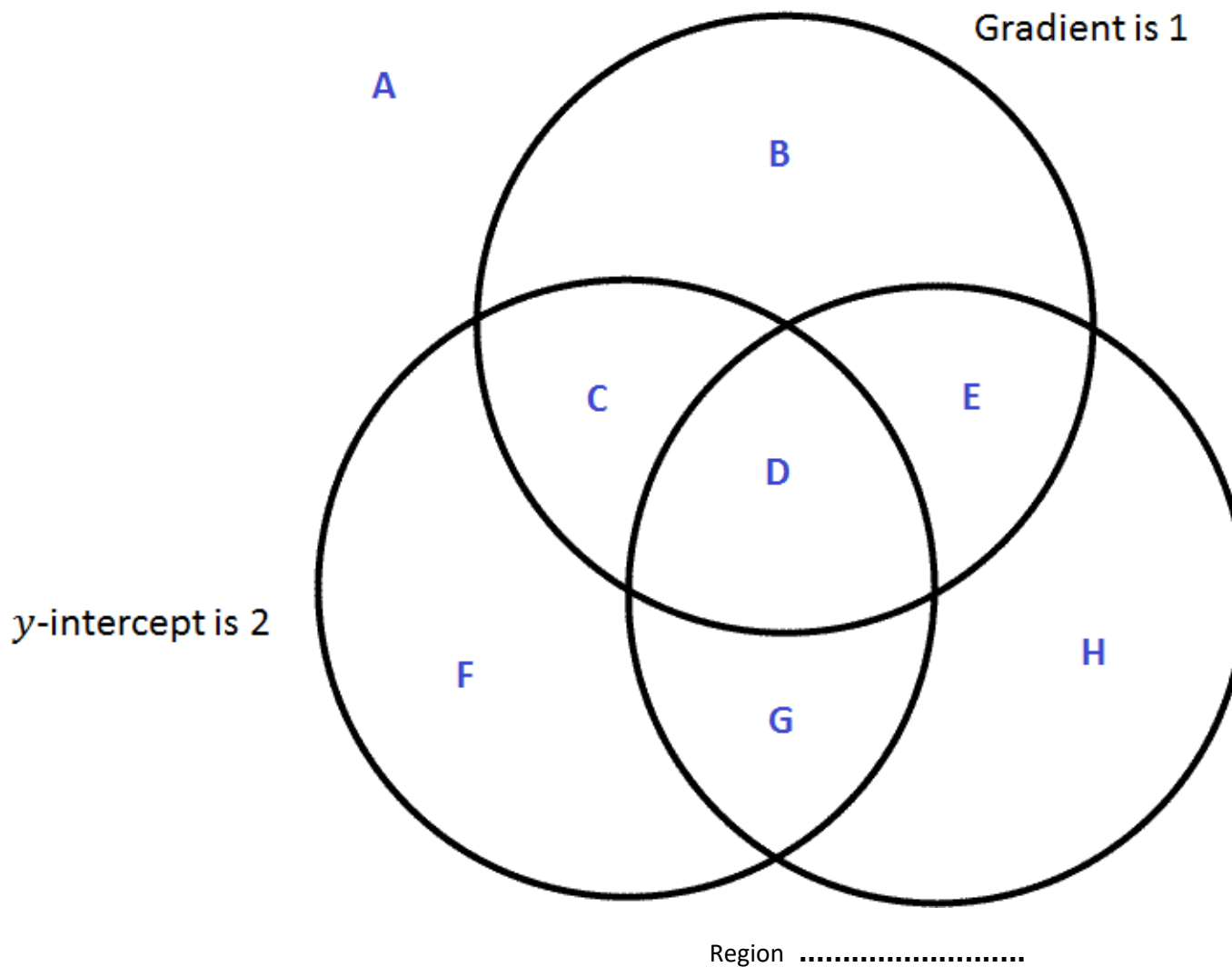
Question 15

What is the gradient of the line with equation $x + 2y = 8$?

....

Question 16

What is the gradient of the line with equation:

$$y = \frac{x - 1}{5}$$

Give your answer in decimal form.

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....

Question 17

A is the point with coordinates $(1,3)$ B is the point with coordinates $(-2,-1)$

The line **L** has equation $3y = 4 - 2x$

Is line **L** parallel to AB?

[   ] Yes

[   ] No

(3 marks)

Question 18

What is the gradient of the line with equation:

$$\frac{3}{5}y = 4 + \frac{2}{7}x$$

....

Question 19

What is the y-intercept of the line with equation:

$$y + 1 = \frac{3 - x}{5}$$

Give your answer in decimal form.

....

Question 20

The equation of a line **L** is $2x - 3y = 6$

Find the equation of the line which is parallel to **L** and passes through the point (6, 9).

....

(2 marks)

Answers

Question 1

(0,4)

(0, 4)	B1

Question 2

(5,0)

(5, 0)	B1	$(5x, 0y)$ is B0 Check diagram for answer written next to P if answer line is blank

Question 3

Q

Q	B1

Question 4

$y = 5x + 4$

	$y = 5x + 4$	B2	oe B1 for $y = mx + 4$ or $y = 5x + c, c \neq 3$ or $5x + 4$
	Additional Guidance		
14	$y = 5x$		B1
	$y = 4$		B1
	$y = 5x - 3$		B1
	$y = 5x + 3$		B0
	$5x + 1$		B0

Question 5

$2x + y = 2$

Question 6

$y = \frac{1}{2}x + 4$

Attempt to work out gradient	M1	e.g. $3 \div 6$ seen oe Right-angled triangle drawn on diagram
$m = \dfrac{1}{2}$ or $c = 4$ seen or implied	M1	e.g $\dfrac{1}{2}x + 4$ oe Gradient $= \dfrac{1}{2}$ or Intercept $= 4$
$y = \dfrac{1}{2}x + 4$	A1	oe

Question 7

$$y = -2x + 4$$

$10 = -2(-3) + c$ or $c = 4$	M1	$y - 10 = -2(x - (-3))$ or $y = -2x + c$
$y = -2x + 4$	A1	

Question 8

$$y = 2x - 4$$

y-intercept $= -4$	M1	oe May be implied from equation or expression
Gradient $= 2$ or $(m =)\ \dfrac{0 - -4}{2 - 0}$ or 2 or $0 = 2m - 4$	M1	oe May be implied from equation or expression
$y = 2x - 4$	A1	oe

Question 9

"$y - \dfrac{3}{2}x = 2$" and "$3x - 2y + 4 = 0$"

B and D	B2	B1 for 1 correct (and 1 incorrect) or 2 correct and 1 incorrect

Question 10

$\sqrt{13}$

Question 11

$\sqrt{26}$

Question 12

$2\sqrt{2}$

Question 13

$$k = 4$$

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| 4 | | 3 | **B1** for c = −2
or **M1** for $y = 3k - 2$ $k \neq 0$
And
M1 for $10 = 3k - 2$ |

Question 14

"G"

Question 15

$-\dfrac{1}{2}$

Question 16

0.2

Question 17

No

eg. $\dfrac{3--1}{1--2}\left(=\dfrac{4}{3}\right)$			**M1** for gradient of line *AB*	**M1** for $y = \dfrac{4}{3}x + \dfrac{5}{3}$	**M2** for sketch of **L** with $(0, \dfrac{4}{3})$ and
$y = \dfrac{4}{3} - \dfrac{2}{3}x$ **or** $y = \dfrac{4-2x}{3}$ **or** $(m =) -\dfrac{2}{3}$			**M1**	**M1** for $\dfrac{4}{3}x + \dfrac{5}{3} = \dfrac{4}{3} - \dfrac{2}{3}x$ oe	(2, 0) marked on axes **AND** (1,3) and (-2 , -1) joined
	No with reason	3	**A1**	accept no with $-\dfrac{2}{3}$ (or − 0.666...) **and** $\dfrac{4}{3}$ (or 1.333...) $-\dfrac{2}{3}$ and $\dfrac{4}{3}$ may be seen as coefficients of *x* in $y = mx + c$ **OR** shows that $3y = 4 - 2x$ and line through *AB* ($y = \dfrac{4}{3}x + \dfrac{5}{3}$) intersect at $x = -\dfrac{1}{6}$ **or** $y = \dfrac{13}{9}$ **OR** **L** has a negative gradient (with evidence), line *AB* has a positive gradient (with evidence) NB: Any value given for a gradient must be correct		

Question 18

$\dfrac{10}{21}$

Question 19

-0.4

Question 20

$y = \dfrac{2}{3}x + 5$

$9 = "\frac{2}{3}" \times 6 + c$		2	M1	for correct substitution into $y = "\frac{2}{3}"x + c$ using their answer to (a) oe	*SC* Award B2 if $y - 9 = "\frac{2}{3}"(x - 6)$ seen; then isw
	$y = \frac{2}{3}x + 5$		A1	for $y = \frac{2}{3}x + 5$ oe inc $2x - 3y = -15$ ft from their answer to (a)	*SC* Award B1 for $2x - 3y = k$ where $k \neq -15$ and $k \neq 6$ with no working
				SC If M0 A0, award B1 for answer with '$y =$' omitted which would otherwise score M1 A1 eg $\frac{2}{3}x + 5$, $2x - 3$ if ans to (a) is 2	*SC* If M0 A0, award B1 for $y = "\frac{2}{3}"x + c$ where $c \neq 5$ or $c \neq 0$ (ie do not award this mark for $y = "\frac{2}{3}"x + 5$ or $y = "\frac{2}{3}"x$) or does not ft from (a)