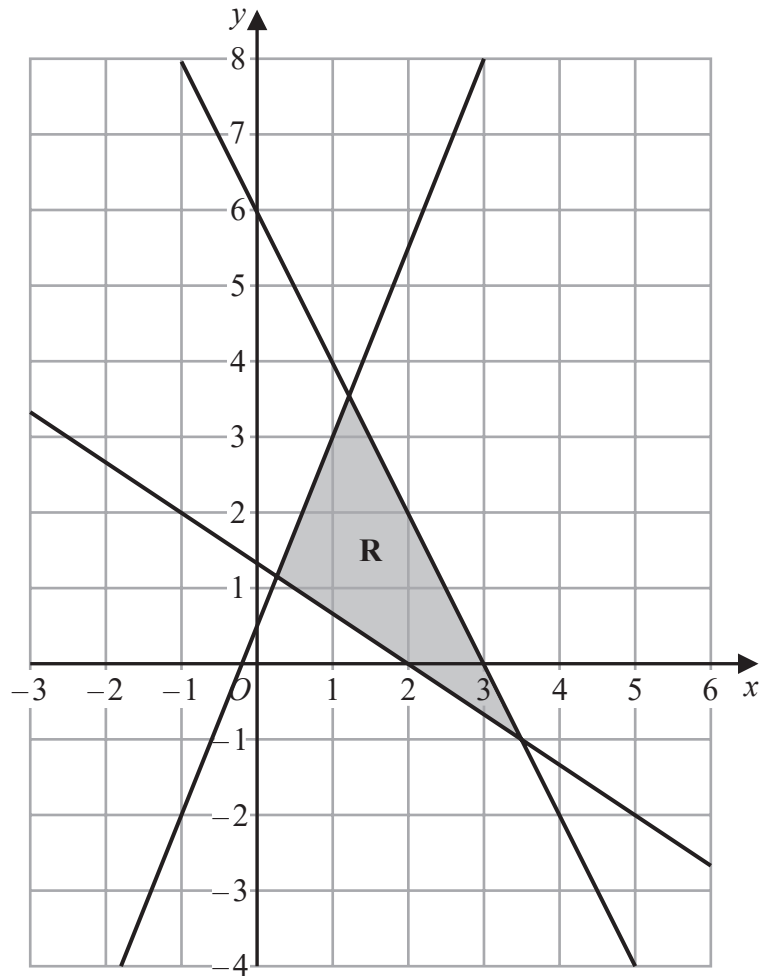


11



The region **R**, shown shaded in the diagram, is bounded by the straight lines with equations

$$2x + y = 6$$

$$2y = 5x + 1$$

$$3y + 2x = 4$$

Write down the three inequalities that define **R**

.....
.....
.....

(Total for Question 11 is 3 marks)

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P 7 2 4 3 7 R A 0 1 3 3 2

12 $3^{\frac{1}{2}} \times 3^{\frac{2}{5}} = 3^m$

(a) Work out the value of m

$$m = \dots\dots\dots (1)$$

$$5^{-10} \div 5^{-4} = 5^n$$

(b) Work out the value of n

$$n = \dots\dots\dots (1)$$

(Total for Question 12 is 2 marks)

13 Expand and simplify $3x(2x - 5)^2$
Show clear algebraic working.

.....
(Total for Question 13 is 3 marks)

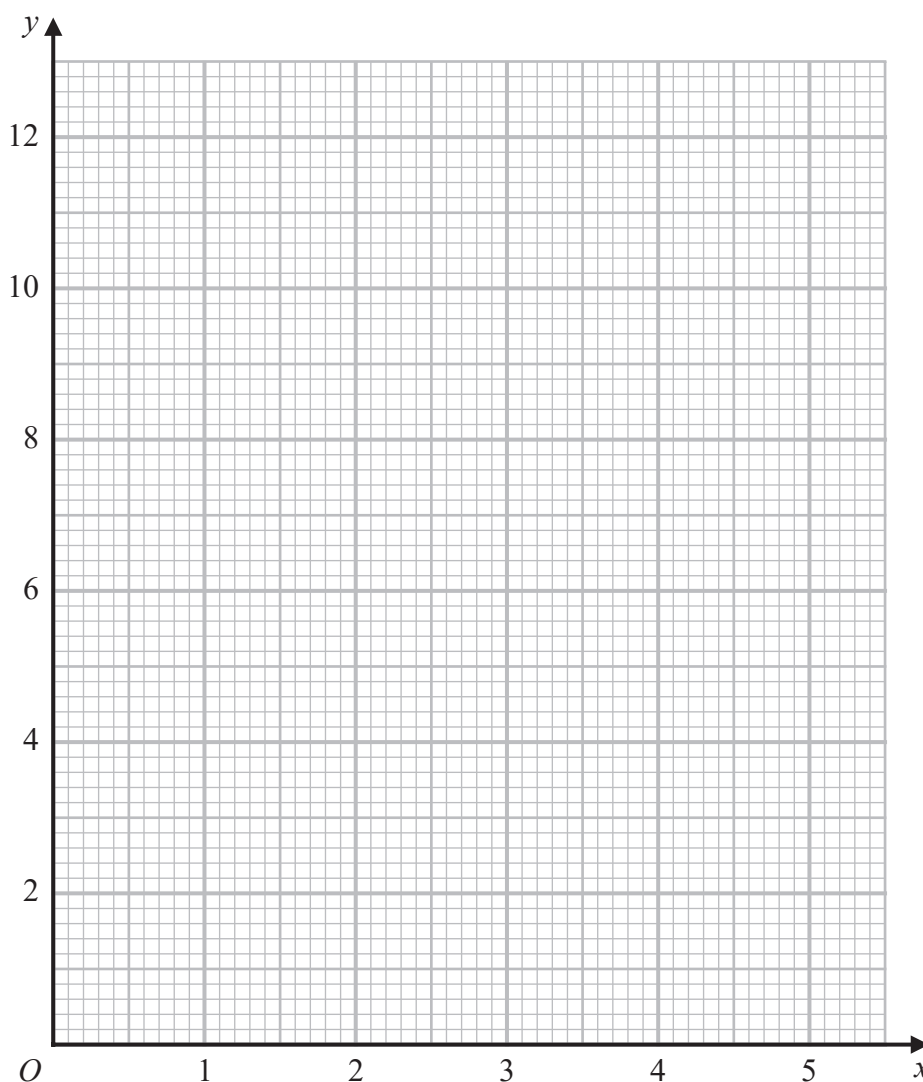


14 (a) Complete the table of values for $y = \frac{2}{x}\left(5 - \frac{1}{x}\right)$

| | | | | | | |
|-----|-----|---|---|-----|-----|-----|
| x | 0.5 | 1 | 2 | 3 | 4 | 5 |
| y | | 8 | | 3.1 | 2.4 | 1.9 |

(1)

(b) On the grid, draw the graph of $y = \frac{2}{x}\left(5 - \frac{1}{x}\right)$ for $0.5 \leq x \leq 5$



(2)

(Total for Question 14 is 3 marks)



(b) Work out the probability that each of the two cards has a number on it.

.....
(2)

(c) Work out the probability that there will be one card with a number on it and one card with a letter on it.

.....
(3)

(Total for Question 15 is 7 marks)

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- 16 Here is a shape formed from two triangles ABC and CDE
 ACD and BCE are straight lines.

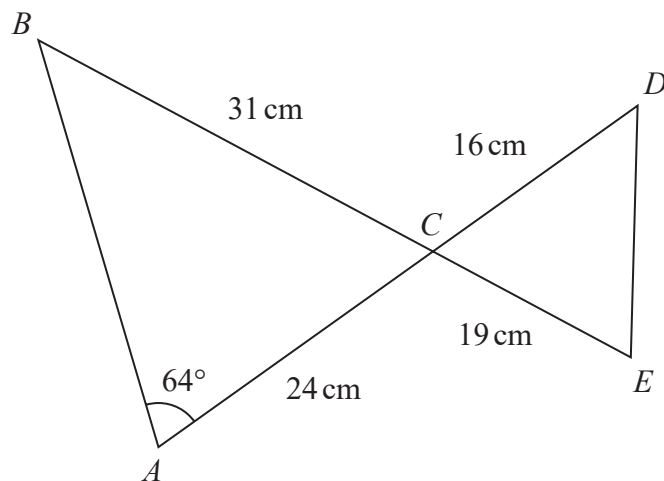


Diagram **NOT**
accurately drawn

$$AC = 24 \text{ cm} \quad BC = 31 \text{ cm} \quad CE = 19 \text{ cm} \quad CD = 16 \text{ cm}$$

$$\text{Angle } BAC = 64^\circ$$

Work out the length of DE

Give your answer correct to 3 significant figures.

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..... cm

(Total for Question 16 is 5 marks)

17 y is inversely proportional to \sqrt{x}

$y = c^4$ when $x = c^2$ where c is a positive constant.

Find a formula for y in terms of x and c

Give your answer in its simplest form.

.....
(Total for Question 17 is 3 marks)



P 7 2 4 3 7 R A 0 1 9 3 2

18 The function f is such that $f(x) = \frac{k}{x}$ where $x \neq 0$ and k is an integer.

(a) Express the inverse function f^{-1} in the form $f^{-1}(x) = \dots$

$$f^{-1}(x) = \dots\dots\dots (1)$$

The function g is such that $g(x) = 2 - 3x^4$ where $x \neq 0$

The function h is such that $h(x) = \frac{3x}{2-x}$ where $x \neq 2$

(b) (i) Find $g(-2)$

$$\dots\dots\dots (1)$$

(ii) Express the composite function hg in the form $hg(x) = \dots$
Give your answer in its simplest form.

$$hg(x) = \dots\dots\dots (2)$$

(Total for Question 18 is 4 marks)



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19 The acceleration, a , of an object is given by

$$a = \frac{v - u}{t}$$

where

$v = 45.23$ correct to 2 decimal places

$u = 5.12$ correct to 2 decimal places

$t = 8.5$ correct to 2 significant figures

By considering bounds, work out the value of a to a suitable degree of accuracy.
Show your working clearly and give a reason for your answer.

$a = \dots\dots\dots$

(Total for Question 19 is 5 marks)

