

DO NOT WRITE IN THIS AREA

Answer ALL TWENTY TWO questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 $w = 5y^2 - y^3$

(a) Work out the value of w when $y = -2$

$w = \dots\dots\dots$
(2)

(b) Factorise fully $8p^2 - 2p$

$\dots\dots\dots$
(2)

(c) Expand $4t(3t - 2)$

$\dots\dots\dots$
(2)

(d) Expand and simplify $(5x - 2)(x + 4)$

$\dots\dots\dots$
(2)

(Total for Question 1 is 8 marks)



- 2 The diagram shows a rectangle $ABCD$ and a semicircle with diameter AB where $AB = 12$ cm. The point E lies on DC and also on the semicircle.

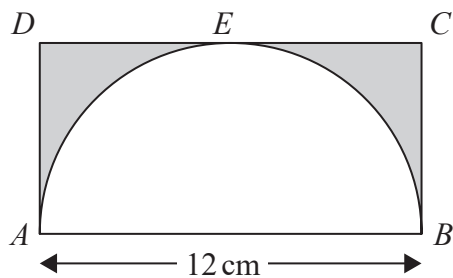


Diagram NOT accurately drawn

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

..... cm²

(Total for Question 2 is 3 marks)

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3 $\mathcal{E} = \{21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$
 $A = \{22, 24, 26, 28, 30\}$
 $B = \{21, 24, 27, 30\}$

(a) List the members of the set

(i) $A \cap B$

.....

(ii) A'

.....

(2)

$C = \{23, 25, 29\}$

(b) Using set notation, find an expression for C in terms of A and B .

.....

(1)

(Total for Question 3 is 3 marks)

4 (a) Simplify $(3k^2)^4$

.....

(2)

(b) Simplify $(21m^4n) \div (3n^{-5})$

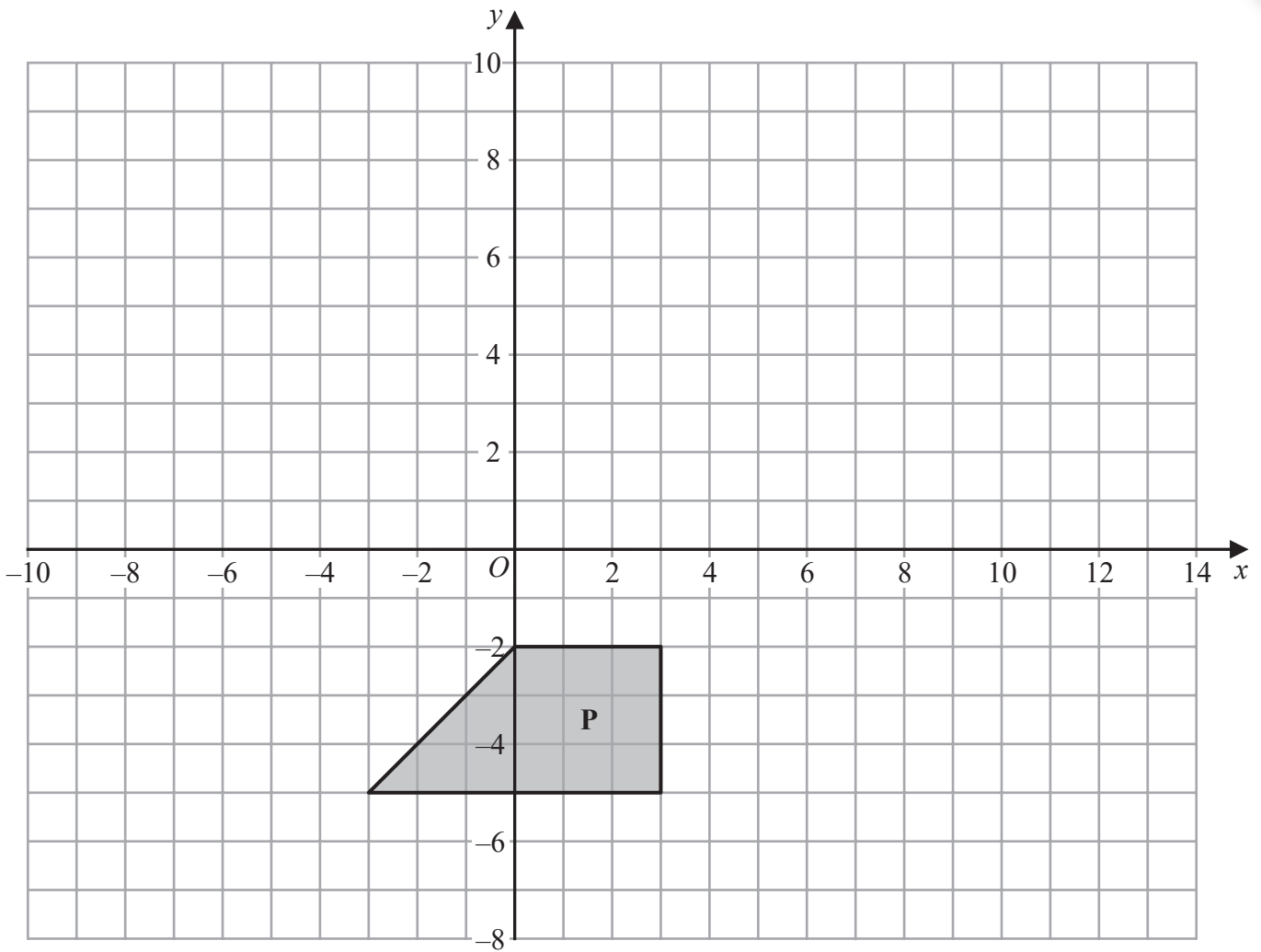
.....

(2)

(Total for Question 4 is 4 marks)



5 Here is a shape **P** drawn on a grid of squares.



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(a) On the grid, rotate shape **P** 180° about the point $(-3, 2)$
Label the new shape **Q**.

(2)

(b) On the grid, translate shape **P** by the vector $\begin{pmatrix} 10 \\ 8 \end{pmatrix}$
Label the new shape **R**.

(1)

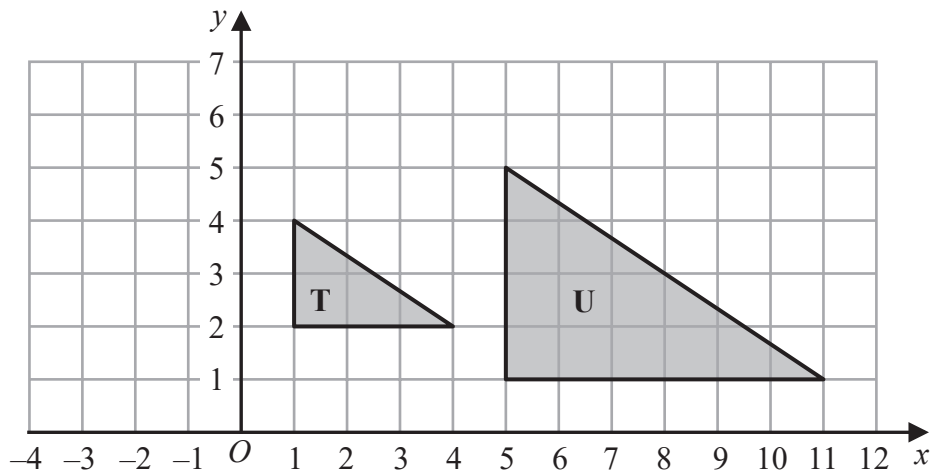


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Here are triangle **T** and triangle **U** drawn on a grid of squares.



(c) Describe fully the single transformation that maps triangle **T** onto triangle **U**.

.....

.....

(3)

(Total for Question 5 is 6 marks)

- 6 On Wednesday, the price of 1 litre of petrol was £1.26
The price of petrol on Wednesday was 5% more than the price of petrol on the previous Monday.

Calculate the price of 30 litres of petrol on the previous Monday.

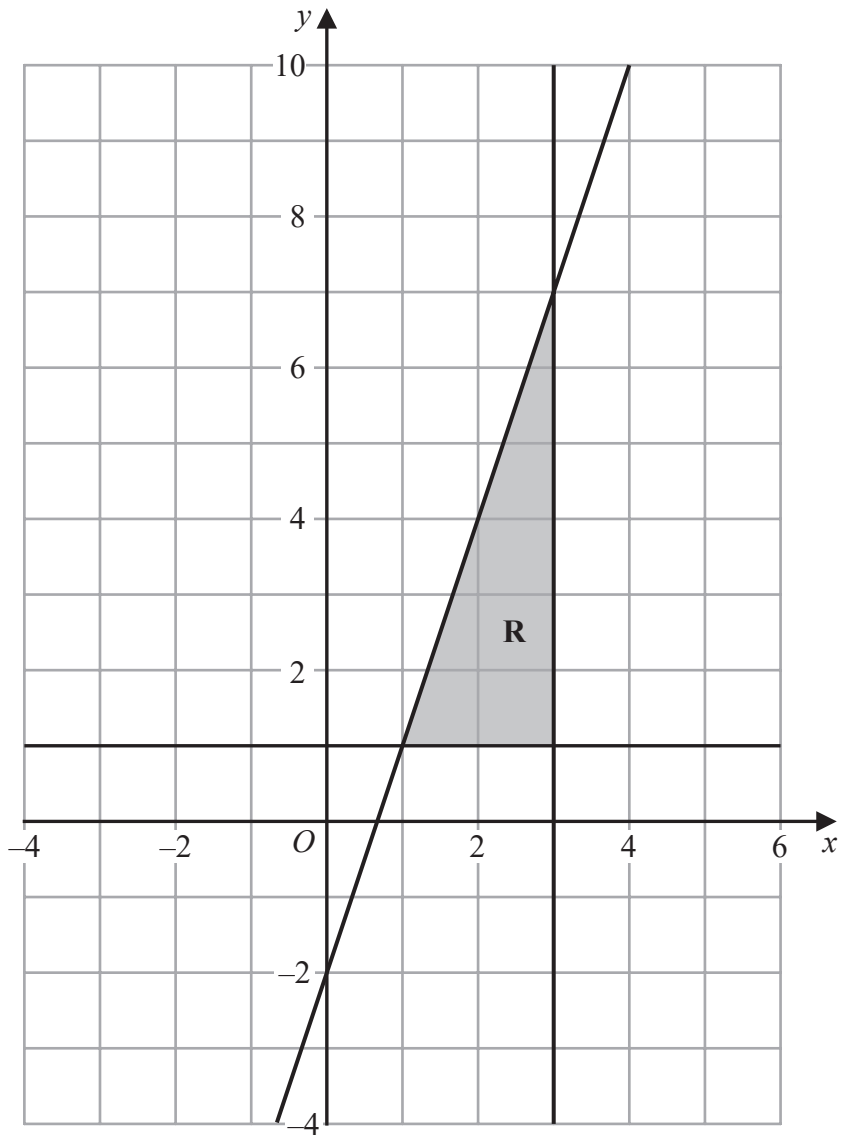
£.....

(Total for Question 6 is 3 marks)



7 The shaded region **R**, shown in the diagram below, is bounded by the straight line with equation $y = 3x - 2$ and by two other straight lines.

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



.....

(Total for Question 7 is 3 marks)



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8 The table gives the length of the coastline, in kilometres, of each of five oceans.

Ocean	Length of coastline (km)
Arctic	4.539×10^4
Atlantic	1.119×10^5
Pacific	1.357×10^5
Indian	6.653×10^4
Southern	1.797×10^4

(a) Which ocean has the greatest length of coastline?

.....
(1)

(b) Calculate the difference between the length of the Atlantic Ocean's coastline and the length of the Southern Ocean's coastline.
Give your answer in standard form.

..... km
(2)

(Total for Question 8 is 3 marks)

9 Solve $x^2 - 21x + 20 = 0$
Show your working clearly.

.....

(Total for Question 9 is 3 marks)

