

Mixed Algebra 3

52 min
43 marks

1. Make x the subject of the formula

$$w = x^2 + y$$

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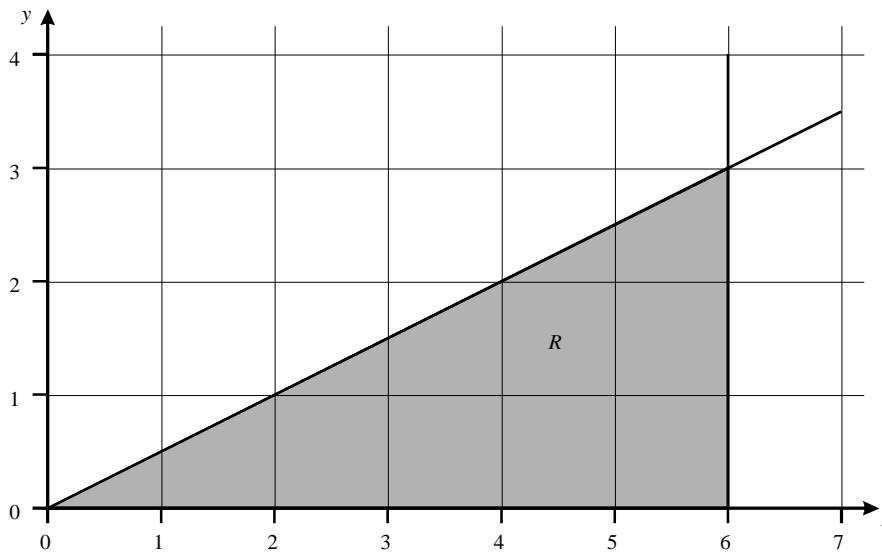
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Answer $x =$

(Total 2 marks)

2. The region R is shown shaded below.



Write down three inequalities which together describe the shaded region.

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Answer

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(Total 3 marks)

3. (a) Expand and simplify

$$(x + 4)^2$$

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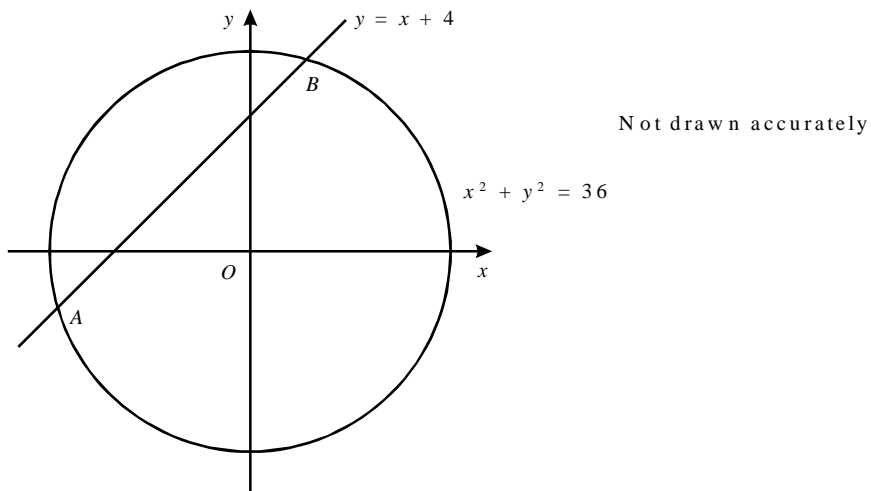
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Answer

(2)

(b) The diagram shows the circle $x^2 + y^2 = 36$ and the line $y = x + 4$.
The line and the circle intersect at the points A and B .



Show that the x -coordinates of A and B are given by the solutions to the equation

$$x^2 + 4x - 10 = 0$$

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(2)

- (c) Solve the equation $x^2 + 4x - 10 = 0$.
Give your answers to 2 decimal places.
You **must** show your working.

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Answer

(3)
(Total 7 marks)

4. Solve the equation $\frac{x}{x+1} - \frac{2}{x-1} = 1$

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Answer

(Total 5 marks)

5. Make r the subject of the formula

$$r - 3 = \pi(t - 2r)$$

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Answer

(Total 4 marks)

6. Simplify

$$\frac{5x^2 + 14x - 3}{x^2 - 9}$$

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Answer

(Total 4 marks)

7. (a) (i) Factorise $x^2 - 7x - 8$

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Answer

(2)

(ii) Hence solve the equation $x^2 - 7x - 8 = 0$

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Answer

(1)

(b) Solve the simultaneous equations

$$\begin{aligned} 5x + 3y &= 13 \\ 3x + 5y &= 3 \end{aligned}$$

You **must** show your working.
Do **not** use trial and improvement.

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Answer $x = \dots\dots\dots$, $y = \dots\dots\dots$

(4)

(Total 7 marks)

8. (a) Expand and simplify $(x - 3)(2x + 1)$

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Answer

(2)

(b) Factorise $x^2 - 7x - 8$

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Answer

(2)

(Total 4 marks)

E X9. Solve the simultaneous equations

$$5x + 3y = 13$$

$$3x + 5y = 3$$

You **must** show your working.

Do **not** use trial and improvement.

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Answer $x = \dots\dots\dots$, $y = \dots\dots\dots$

(Total 4 marks)

10. On the grid below, indicate clearly the region defined by the three inequalities

$$\begin{aligned}x &\geq 1 \\ y &\geq x - 1 \\ x + y &\leq 7\end{aligned}$$

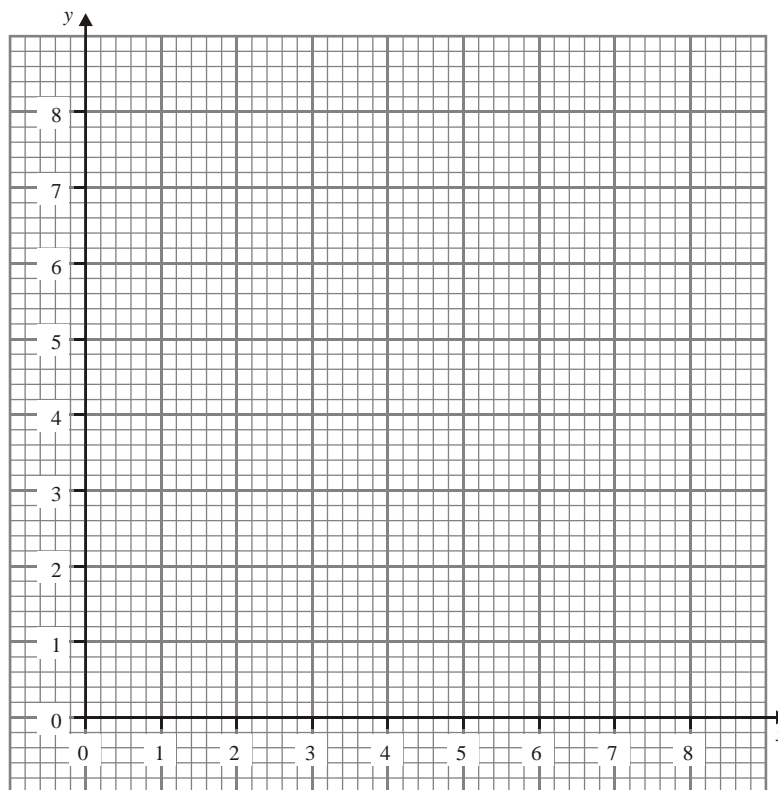
Mark the region with an *R*.

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(Total 3 marks)