

11T1_Revision_26 & 27 Sept

Total Marks: 20

Question 1

Solve by Factorizing $2x^2 + 5x - 18 = 0$

(3 marks)

Question 2

Solve by Factorizing $2x^2 - 2x - 40 = 0$

(3 marks)

Question 3

E267: Solve quadratic equations by using the quadratic formula.

The area of the trapezium ABCD is 25cm^2 .

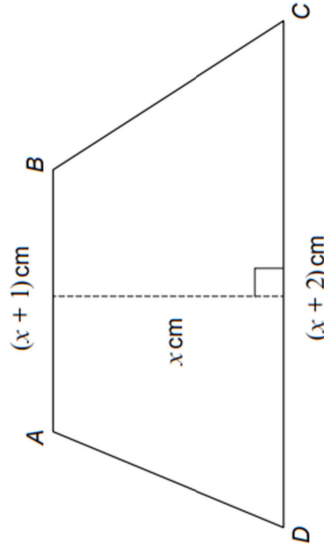


Diagram not drawn to scale

Solve the equation $2x^2 + 3x - 50 = 0$ to calculate the lengths AB and DC.
Give your answers correct to 1 decimal place.

Length of AB =

Length of DC =

(4 marks)

Question 4

E272: Solve simultaneous equations where one is quadratic, one is linear. E267: Solve quadratic equations by using the quadratic formula. E269: Form quadratic or non-linear equations from context (excluding probability problems).



A solid cuboid has a volume of 40 cm^3 .
The cuboid has a total surface area of 100 cm^2 .
One edge of the cuboid has length 2 cm .

Find the length of a diagonal of the cuboid.
Give your answer correct to 3 significant figures.

..... cm
(6 marks)

Question 5

K616: Solve quadratics of the form $|x^2 + bx + c = 0|$ requiring rearrangement and factorising. E268: Solve quadratic equations by completing the square.

Solve

$$(x - 2)^2 = 3$$

Give your solutions correct to 3 significant figures.

.....
(2 marks)

Question 6

E268: Solve quadratic equations by completing the square.

Joy is solving a quadratic equation of the form $x^2 + bx + c = 0$ where b and c are integers.

She correctly solves the equation to get $x = 3 \pm \sqrt{13}$

Work out the values of b and c .

.....
(3 marks)

Answers

Question 1

Answer: $x = 2$ or $x = -4.5$

Question 2

Answer: $x = 5$ or -4

Question 3: Answer: Length of AB = 5.3 cm
and Length of DC = 6.3 cm

| | | |
|--|----------|---|
| 11(a)(i). $x = \frac{-(3) \pm \sqrt{(3)^2 - 4 \times 2 \times (-50)}}{2 \times 2}$ | M1 | Maybe seen in a(i). Allow one slip in substitution for M1 only , but must be correct formula. |
| $= \frac{-3 \pm \sqrt{409}}{4}$ | A1 | |
| $x = 4.3(059...)$ ($x = -5.8(059...)$) (AB) = 5.3(cm) AND (DC) = 6.3(cm) | A1 B1 | CAO. Answers must be to 1 d.p. FT 'their positive x' provided M1 awarded. |

Question 4: Answer: 13.7 cm

| | | |
|------|----|---|
| 13.7 | P1 | for setting up problem, assignment of variables, forming an equation, e.g. $2xy = 40$ oe |
| | P1 | for forming a second equation, e.g. $2x + 2x + 2y + xy + xy = 100$ oe |
| | P1 | for eliminating one variable, e.g. $4x + \frac{80}{x} + 40 = 100$ or $4x^2 - 60x + 80 = 0$ or $x^2 - 15x + 20 = 0$ |
| | P1 | for solving equation to find x or y; e.g. $x = \frac{15 \pm \sqrt{145}}{2}$ (=1.479... or 13.520...) |
| | P1 | for process to find length of diagonal, e.g. $\sqrt{2^2 + 1.479...^2} + 13.520...^2$ |
| | A1 | for 13.7(4...) |

Question 5

$x = 0.268$ or $x = 3.73$

| | | | | |
|---|----|-------------|----|--|
| $\frac{-4 \pm \sqrt{(-4)^2 - 4 \times 1 \times 1}}{2 \times 1}$ | M1 | 0.268, 3.73 | M1 | for $x^2 - 2 = \pm\sqrt{3}$ oe or one solution or use of $x^2 - 4x + 1 = 0$ to substitute into formula (allow one error in substitution) |
| | A1 | | A1 | 0.267 - 0.27, 3.7 - 3.74 |

Question 6

$b = -6, c = -4$

| | | |
|-----------------------|-------|---|
| $3 = -\frac{b}{2}$ | M1 | $\frac{\pm 6 \pm \sqrt{26}}{2}$ |
| $\sqrt{52}$ | M1dep | |
| $b = -6$ and $c = -4$ | A1 | SC2 either value given correctly SC1 $b = 6$ |