



5.8F Solving Quadratics: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 55 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Work out the value of x .
 $x^2 = 49$

(Total for Question 1 is 1 mark)

- 2** Work out the value of x .
 $(x + 3)(x - 2) = 0$

(Total for Question 2 is 1 mark)

- 3** Work out the values of x .
 $x^2 - 5x = 0$

(Total for Question 3 is 2 marks)

- 4** Solve the equation by factorising.
 $2x^2 + 3x = 0$

(Total for Question 4 is 2 marks)

- 5 Work out the values of x .

$$x^2 - x - 6 = 0$$

(Total for Question 5 is 3 marks)

- 6 Solve the equation.

$$3x^2 - 12 = 0$$

(Total for Question 6 is 3 marks)

- 7 Work out x .

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

(Total for Question 7 is 3 marks)

- 8 A rectangle has length $(x + 5)$ metres and width $(x - 1)$ metres. The area is 40 m^2 .
Write down an equation and solve for x , explaining why only one of your solutions is valid in this context.

(Total for Question 8 is 4 marks)

9 Solve the equation by factorising.

$$4x^2 - 9 = 0$$

(Total for Question 9 is 4 marks)

10 A small garden is a square of side $(2x - 1)$ metres. Its area is 49 m^2 .

Work out the values of x .

(Total for Question 10 is 5 marks)

11 Priya is making a rectangular flowerbed. The length is 3 metres more than the width. The area is 70 m^2 .

Let the width be x metres.

(a) Write down an equation in x .

(b) Solve the equation and give the width of the flowerbed.

(a) (a) Write down an equation in x . (1)

(b) (b) Solve the equation and give the width of the flowerbed. (5)

(Total for Question 11 is 6 marks)

12 A rectangular shed has length $4x$ metres and width $(x + 2)$ metres. The area of the shed is 96 m^2 .

Work out the value of x and then find the actual length and width of the shed.

(Total for Question 12 is 6 marks)

Mark scheme · 5.8F Solving Quadratics: Foundation Tier Practice

Question 1

- **B1** $x = 7$ or $x = -7$ cao
- **Answer:** $x = 7$ or $x = -7$

Question 2

- **B1** $x = -3$ or $x = 2$ cao
- **Answer:** $x = -3$ or $x = 2$

Question 3

- **M1** factorise to $x(x - 5) = 0$ or equivalent
- **A1** $x = 0$ and $x = 5$ cao
- **Answer:** $x = 0$ and $x = 5$

Question 4

- **M1** factorise to $x(2x + 3) = 0$ or equivalent
- **A1** $x = 0$ and $x = -3/2$ cao
- **Answer:** $x = 0$ and $x = -3/2$

Question 5

- **M1** factorise to $(x - 3)(x + 2) = 0$ or equivalent
- **A1** $x = 3$ cao
- **A1** $x = -2$ cao
- **Answer:** $x = 3$ and $x = -2$

Question 6

- **M1** rearrange to $3x^2 = 12$ and divide to $x^2 = 4$ or equivalent
- **A1** $x = 2$ cao
- **A1** $x = -2$ cao
- **Answer:** $x = 2$ and $x = -2$

Question 7

- **M1** recognise perfect square: $(x + 2)^2 = 0$ or factorise to $(x + 2)(x + 2)$
- **A1** $x = -2$ cao
- **isw** second A1 is dependent so isw
- **Answer:** $x = -2$

Question 8

- **M1** form equation $(x + 5)(x - 1) = 40$ or equivalent
- **M1** expand to $x^2 + 4x - 5 = 40$ then rearrange to $x^2 + 4x - 45 = 0$
- **A1** factorise to $(x + 9)(x - 5) = 0$ giving $x = -9$ or $x = 5$
- **A1** reject $x = -9$ (width $x - 1$ must be positive, so $x > 1$); $x = 5$ cao
- **Answer:** $x = 5$ (length = 10 m, width = 4 m, area = 40 m²). $x = -9$ is rejected as it gives a negative width.

Question 9

- **M1** recognise difference of squares: $(2x - 3)(2x + 3) = 0$ or show correct factorisation
- **A1** $2x - 3 = 0$ gives $x = 3/2$ cao
- **A1** $2x + 3 = 0$ gives $x = -3/2$ cao
- **isw** final A1 dependent on correct factorisation
- **Answer:** $x = 3/2$ and $x = -3/2$

Question 10

- **M1** form equation $(2x - 1)^2 = 49$ or equivalent
- **M1** expand or take square roots: $(2x - 1) = 7$ or $(2x - 1) = -7$
- **A1** from $2x - 1 = 7$, $x = 4$ cao
- **A1** from $2x - 1 = -7$, $x = -3$ cao
- **C1** communicate both solutions with working shown
- **Answer: $x = 4$ or $x = -3$**

Question 11

- (a) **M1** equation $x(x + 3) = 70$ or equivalent
- (a) **Answer: $x(x + 3) = 70$**
- (b) **M1** expand to $x^2 + 3x - 70 = 0$ or rearrange to standard form
- (b) **M1** factorise to $(x + 10)(x - 7) = 0$ or equivalent
- (b) **M1** state both roots $x = 7$ and $x = -10$ or show solving each factor
- (b) **A1** $x = 7$ cao
- (b) **A1** width = 7 m stated as the positive practical solution
- (b) **Answer: $x = 7$ (width = 7 m)**

Question 12

- **M1** form equation $4x(x + 2) = 96$ or equivalent
- **M1** simplify to $4x^2 + 8x - 96 = 0$ and divide by 4 to get $x^2 + 2x - 24 = 0$
- **M1** factorise to $(x + 6)(x - 4) = 0$ or equivalent
- **A1** $x = 4$ cao
- **A1** $x = -6$ cao
- **A1** state length = 16 m and width = 6 m for the positive solution
- **Answer: $x = 4$ (discard $x = -6$). Length = $4x = 16$ m, width = $x + 2 = 6$ m. Working: $4x(x + 2) = 96 \rightarrow x^2 + 2x - 24 = 0 \rightarrow (x + 6)(x - 4) = 0$.**