Quadratic Equations: exam questions

10 questions · 29 marks · mark schemes at the end

Name _____ Date _____ Score / 29

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/quadratic-equations

1. **2 marks**

Solve $x^2 + 3x - 28 = 0$.

2. **2 marks**

Solve $2x^2 - 7x + 3 = 0$.

3. **3 marks**

Solve $3x^2 + 5x - 4 = 0$. Give your answers correct to 2 decimal places.

4. **3 marks**

Solve $x(x-4)=21$.

5. **4 marks**

A rectangle has length $(x+4)$ cm and width $(x-2)$ cm. Its area is 40 cm².

Work out the value of x.

6. **3 marks**

Solve $5x^2=3x+1$. Give your answers correct to 3 significant figures.

7. **3 marks**

Solve $\frac{4}{x}=x-3$.

8. **4 marks**

The sides of a right-angled triangle are x cm, $(x + 7)$ cm and $(x + 8)$ cm.

Work out the value of x.

9. **2 marks**

Solve $9x^2 - 16 = 0$.

10. **3 marks**

A ball is thrown upwards. Its height, h metres, after t seconds is given by $h = 20t - 5t^2$.

Find the two times when the ball is 15 m above the ground.

Answers and worked solutions

Question 1 — 2 marks

M1 $(x+7)(x-4)$

A1 $x=-7$ or $x=4$

Answer: $x=-7$ or $x=4$

Question 2 — 2 marks

M1 $(2x-1)(x-3)$

A1 $x=\frac{1}{2}$ or $x=3$

Answer: $x=\frac{1}{2}$ or $x=3$

Question 3 — 3 marks

M1 $x=\dfrac{-5\pm\sqrt{5^2-4\times3\times(-4)}}{2\times3}$

M1 $\dfrac{-5\pm\sqrt{73}}{6}$

A1 $x=0.59$ or $x=-2.26$

Answer: $x=0.59$ or $x=-2.26$

Question 4 — 3 marks

M1 $x^2-4x-21=0$

M1 $(x-7)(x+3)$

A1 $x=7$ or $x=-3$

Answer: $x=7$ or $x=-3$

Question 5 — 4 marks

M1 $(x+4)(x-2)=40$

M1 $x^2+2x-48=0$

M1 $(x+8)(x-6)=0$

A1 $x=6$ ($x=-8$ gives negative lengths)

Answer: $x=6$

Question 6 — 3 marks

M1 $5x^2-3x-1=0$

M1 $x=\dfrac{3\pm\sqrt{9+20}}{10}$

A1 $x=0.839$ or $x=-0.239$

Answer: $x=0.839$ or $x=-0.239$

Question 7 — 3 marks

M1 $4=x^2-3x$

M1 $(x-4)(x+1)=0$

A1 $x=4$ or $x=-1$

Answer: $x=4$ or $x=-1$

Question 8 — 4 marks

M1 $x^2+(x+7)^2=(x+8)^2$

M1 $x^2-2x-15=0$

M1 $(x-5)(x+3)=0$

A1 $x=5$

Answer: $x=5$

Question 9 — 2 marks

M1 $x^2=\dfrac{16}{9}$, or $(3x+4)(3x-4)$

A1 $x=\pm\frac{4}{3}$

Answer: $x=\frac{4}{3}$ or $x=-\frac{4}{3}$

Question 10 — 3 marks

M1 $20t-5t^2=15$

M1 $t^2-4t+3=0$, $(t-1)(t-3)=0$

A1 1 second and 3 seconds

Answer: 1 second and 3 seconds

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/quadratic-equations
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