FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

A18: Quadratic equations

Solve problems by forming and solving quadratic equations

20 marks · 25 minutes · Non-calculator

1) A rectangle is 4 cm longer than it is wide. Its area is 60 cm^2. Find its perimeter.

..... cm

[Question 1: 3 marks]

2) A ball's height is $h = 25t - 5t^2$ metres. At what times is it 20 m high?

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[Question 2: 3 marks]

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3) A right-angled triangle has sides x, $(x + 7)$ and $(x + 8)$ cm. Find the lengths of the sides.

..... cm

[Question 3: 4 marks]

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4) The product of two consecutive odd numbers is 143. Find the numbers.

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[Question 4: 3 marks]

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5) A rectangular lawn is 10 m by 8 m. A path of width x m goes all the way round it. The total area of lawn and path is 120 m^2. Find x.

..... m

[Question 5: 4 marks]

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6) Find the values of k for which $x^2 + kx + 16 = 0$ has exactly one solution.

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[Question 6: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	32	$x(x + 4) = 60$ (P1); $x = 6$ (P1); $2(6 + 10)$ (A1).
2	1 and 4	$5t^2 - 25t + 20 = 0$ (P1); $(t - 1)(t - 4)$ (P1); A1.
3	5, 12, 13	$x^2 + (x + 7)^2 = (x + 8)^2$ (P1); $x^2 - 2x - 15 = 0$ (P1); $x = 5$ (P1); sides (A1).
4	11 and 13	$(2n - 1)(2n + 1) = 143$ or trial (P1); $4n^2 = 144$ (P1); A1.
5	1	$(10 + 2x)(8 + 2x) = 120$ (P1); $x^2 + 9x - 10 = 0$ (P1); $(x + 10)(x - 1)$ (P1); positive so 1 (A1).
6	± 8	$k^2 - 64 = 0$ or perfect square (P1, P1); A1.