## Class Test ❰ 4 ❱

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**Answer all questions. Show your working clearly.**

1. Solve the following equations.
    (a) $14 - (3x + 1)(x + 2) = -8$ [2]
    (b) $\frac{1}{2}(4p + 1)(p + 7) + \frac{1}{2}p(p + 22) = -\frac{3}{2}$ [2]

2. There are $(2a - 1)(2a + 3)$ apples and $(3a + 7)(3a - 7)$ oranges.
    (a) Given that there is a total of 77 apples and oranges, prove that $13a^2 + 4a - 129 = 0$. [2]
    (b) Solve for a. [1]
    (c) If an apple costs 60¢ and an orange costs 90¢, find the total cost of the fruits. [2]

3. $PQRS$ is a parallelogram.
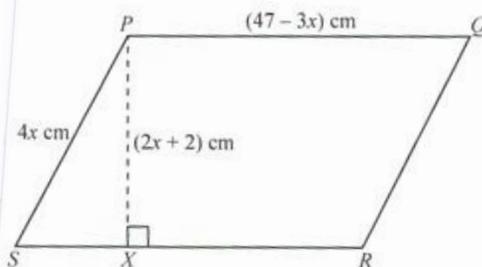
    (a) Give that the area of $PQRS$ is 384 cm², find an expression in terms of x, and show that it reduces to $6x^2 - 88x + 290 = 0$. [2]
    (b) Given that x is an integer, solve for x. [1]
    (c) Find the perimeter of $PQRS$. [1]

4. The equation of the curve is $y = px^2 + 40x + 39$.
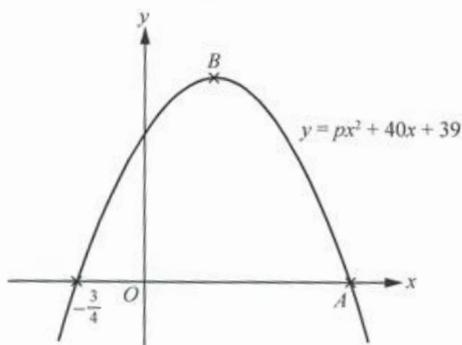
    (a) Find the value of p. [1]
    (b) Find the coordinates of point A. [2]
    (c) Find the coordinates of point B, given that point B is the maximum point. [1]

Chapter 5 • Quadratic Equations and Graphs

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5.   The displacement, d, a toy car is from point X is given by $-\frac{1}{2}t^2 + 4t - a$, where t is the time in seconds.

(a)   Given that the toy car travels $2\frac{1}{2}$ m in 2 seconds, find the value of a.   [1]

(b)   On a sheet of graph paper, using a scale of 1 cm to 1 unit on both axes, draw the graph of $d = -\frac{1}{2}t^2 + 4t - a$ for $0 \leqslant t \leqslant 8$.   [2]

(c)   Find the furthest displacement the toy car is from point X, and the time at which the toy car reaches this displacement.   [2]

(d)   (i)   Solve the equation $-\frac{1}{2}t^2 + 4t - a = 0$.   [1]

(ii)   What is the meaning of the solution obtained?   [1]

6.   (a)   If $x = -\frac{3}{2}$ is a solution of $nx^2 + 11x - 15 = 0$, find the value of n.   [2]

(b)   Find the other solution of x.   [1]

7.   The equation of a graph is $y = -\frac{1}{2}x^2 + nx + 3$.

x	-2	0	2	4	6
y			6		

(a)   (i)   Find the value of n.   [1]

(ii)   Copy and complete the table above.   [1]

(b)   On a sheet of graph paper, using a scale of 1 cm to 1 unit on both axes, draw the graph of $y = -\frac{1}{2}x^2 + nx + 3$ for $-2 \leqslant x \leqslant 6$.   [3]

(c)   (i)   State the equation of the line of symmetry.   [1]

(ii)   When $y = 3$, find the value of x.   [1]

(d)   Solve the equation $x^2 - 5x = -4$.   [2]

8.   Solve the following equations.

(a) $(5a - 2)(a + 1) = -2 + a^2$ [2]

(b) $-8y + (3y + 2)(4y + 1) = -(y + 4)(3y - 2)$ [2]