Chapter 2 Coordinate geometry and linear relations: **Assignment**

Student name:

1 Find the equation of the line with gradient 3 and which passes through the point with coordinates (1, 4).

2 For the line with equation $3x + 6y = 12$, find:

a the gradient of the line

b the x-axis intercept of the line

c the y-axis intercept of the line.

3 Find the equation of the line that is perpendicular to the line with equation $y = -2x + 6$ and passes through the point with coordinates (1, 6).

4 If 8 kilograms of potatoes and 5 kilograms of carrots cost \$28, and 2 kilograms of potatoes and 3 kilograms of carrots cost \$11.20, what is the cost of 1 kilogram of each item?

5 **a** Find the midpoint of the line segment joining the points with coordinates (3, 5) and (–2, 8).

b The point with coordinates (4, –6) is the midpoint of the line segment AB. The coordinates of the endpoints are $(1, a)$ and $(b, -4)$. Find the values of a and b.

c Find the distance between the points (1, –4) and (11, 8).

6 The cost, \$$C$, of electricity is determined by the number, n, of units used. The rule for determining the cost is of the form $C = pn + q$. It is known that the cost of 200 units of electricity is \$200 and of 500 units \$380. Find the values of p and q.

7 The points A, B and C have coordinates $A(0, 7)$, $B(6, -1)$ and $C(6, 9)$.

a Find the length of line segment AC.

b Calculate the gradient of AC.

c Find the equation of line AC.

d $ACPB$ is a quadrilateral with BC its axis of symmetry. Find the coordinates of P.

e Find the area of quadrilateral $ACPB$.

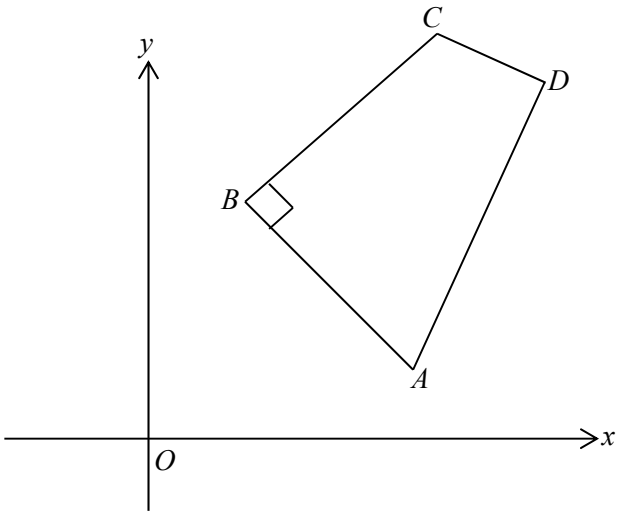
8 Find the magnitude of the acute angle between the lines with equations $y = 2x + 3$ and

$y = -\frac{1}{3}x + 3$.

9 Points A and B have coordinates (7, 0) and (0, 9). Find the midpoint of the line segment AB and the equation of the perpendicular bisector of AB.

10 $ABCD$ is a quadrilateral with angle ABC a right angle. D lies on the perpendicular bisector of AB. The coordinates of A and B are (7, 2) and (2, 5) respectively.

The equation of line AD is $y = 4x - 26$.



a Find the equation of the perpendicular bisector of the line segment AB.

b Find the coordinates of point D.

c Find the gradient of the line BC.

d Find the value of the second coordinate, c, of point $C(8, c)$.

e Find the area of quadrilateral $ABCD$.

Answers

1 $y = 3x + 1$

2 **a** Gradient: $m = -\frac{1}{2}$

b x-axis intercept: $x = 4$

c y-axis intercept: $y = 2$

3 $y = \frac{1}{2}x + \frac{11}{2}$

4 1 kilogram of potatoes costs \$2 and 1 kilogram of carrots costs \$2.40.

5 **a** The midpoint of line segment is $\left(\frac{1}{2}, \frac{13}{2}\right)$.

b $a = -8, b = 7$

c Distance between points is $2\sqrt{61}$.

6 $p = 0.6$ and $q = 80$

7 **a** Length of line segment AC is $2\sqrt{10}$.

b $m = \frac{1}{3}$

c $y = \frac{1}{3}x + 7$

d $P(12, 7)$

e Area = 60 units^2

8 Magnitude of acute angle between lines is $(\tan^{-1}7)^\circ$.

9 Midpoint of $AB = \left(\frac{7}{2}, \frac{9}{2}\right)$; perpendicular bisector of AB is $y = \frac{7}{9}x + \frac{16}{9}$

10 **a** Equation of perpendicular bisector of AB is $y = \frac{5}{3}x - 4$.

b $D\left(\frac{66}{7}, \frac{82}{7}\right)$

c $m = \frac{5}{3}$

d $c = 15$

e Area ≈ 44.9 units^2