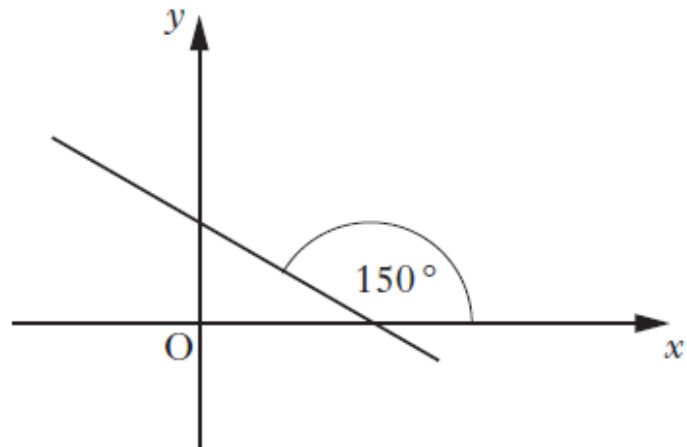4. What is the gradient of the line
    shown in the diagram?

    A $-\sqrt{3}$

    B $-\dfrac{1}{\sqrt{3}}$

    C $-\dfrac{1}{2}$

    D $-\dfrac{\sqrt{3}}{2}$

2. A line l has equation $3y + 2x = 6$.

    What is the gradient of any line parallel to l?

    A -2

    B $-\dfrac{2}{3}$

    C $\dfrac{3}{2}$

    D 2

Here are two statements about the points S(2, 3) and T(5, −1):

(1) The length of ST $= 5$ units;

(2) The gradient of ST $= \dfrac{4}{3}$.
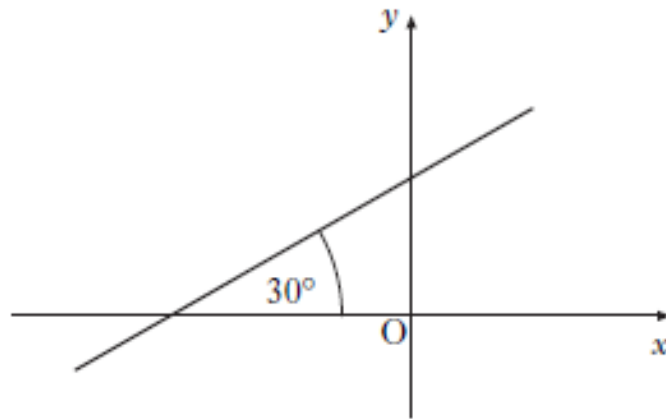
Which of the following is true?

A   Neither statement is correct.

B   Only statement (1) is correct.

C   Only statement (2) is correct.

D   Both statements are correct.

. A line makes an angle of 30° with the positive direction of the x-axis as shown.

What is the gradient of the line?

A $\dfrac{1}{\sqrt{3}}$

B $\dfrac{1}{\sqrt{2}}$

C $\dfrac{1}{2}$

D $\dfrac{\sqrt{3}}{2}$

A line L is perpendicular to the line with equation $2x - 3y - 6 = 0$.

What is the gradient of the line L?

A $-\dfrac{3}{2}$

B $-\dfrac{1}{2}$

C $\dfrac{2}{3}$

D 2

(a) Find the equation of ℓ_1, the perpendicular bisector of the line joining P(3, –3) to Q(–1, 9). **4**

(b) Find the equation of ℓ_2 which is parallel to PQ and passes through R(1, –2). **2**

(c) Find the point of intersection of ℓ_1 and ℓ_2. **3**

(d) Hence find the shortest distance between PQ and ℓ_2. **2**

A quadrilateral has vertices A(–1, 8), B(7, 12), C(8, 5) and D(2, –3) as shown in the diagram.
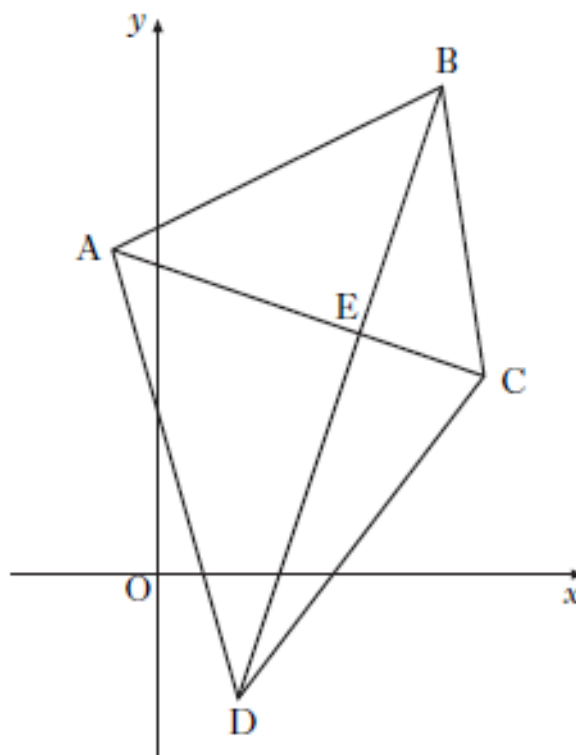
(a) Find the equation of diagonal BD. **2**

(b) The equation of diagonal AC is $x + 3y = 23$.

Find the coordinates of E, the point of intersection of the diagonals. **3**

(c) (i) Find the equation of the perpendicular bisector of AB.

(ii) Show that this line passes through E. **5**

Triangle ABC has vertices A(4, 0), B(–4, 16) and C(18, 20), as shown in the diagram opposite.

Medians AP and CR intersect at the point T(6, 12).
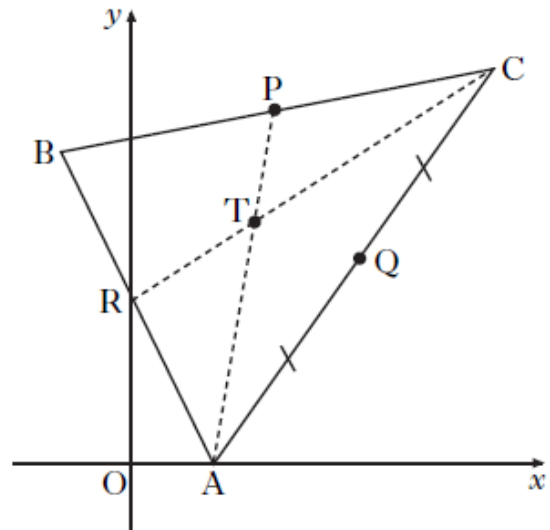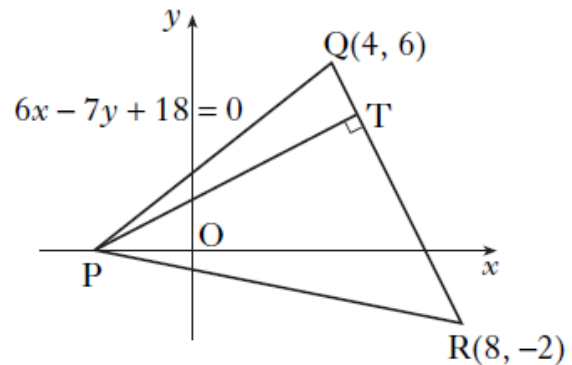

(a) Find the equation of median BQ. **3**

(b) Verify that T lies on BQ. **1**

Triangle PQR has vertex P on the x-axis, as shown in the diagram.

Q and R are the points (4, 6) and (8, –2) respectively.

The equation of PQ is $6x - 7y + 18 = 0$.

(a) State the coordinates of P. **1**

(b) Find the equation of the altitude of the triangle from P. **3**

(c) The altitude from P meets the line QR at T. Find the coordinates of T. **4**

Triangle PQR has vertices at P(−3, −2), Q(−1, 4) and R(3, 6).
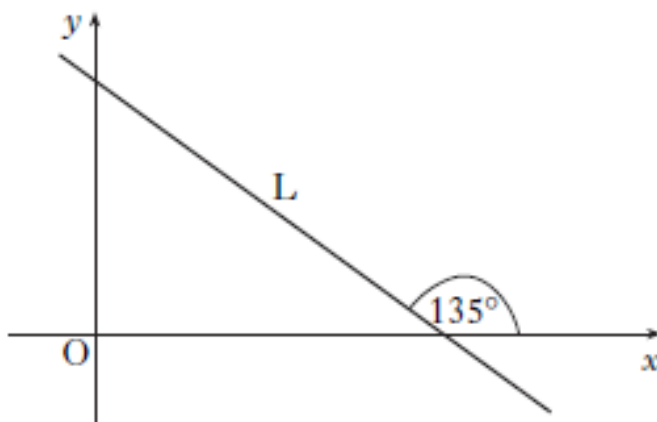
PS is a median. What is the gradient of PS?

A   −2

B $-\dfrac{7}{4}$

C   1

D $\dfrac{7}{4}$

The diagram shows a line L; the angle between L and the positive direction of the x-axis is 135°, as shown.

What is the gradient of line L?

A $-\dfrac{1}{2}$

B $-\dfrac{\sqrt{3}}{2}$
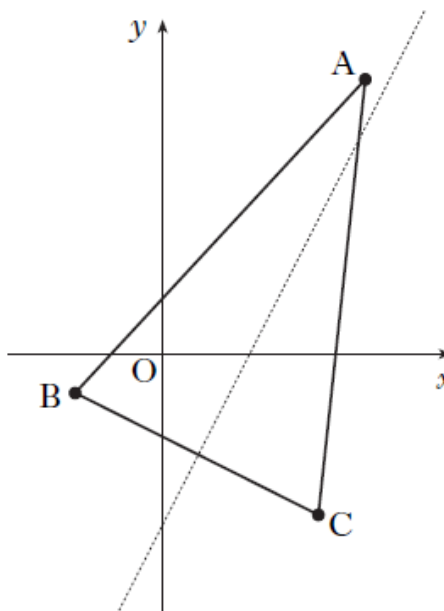
C   −1

D $\dfrac{1}{2}$

The vertices of triangle ABC are A(7, 9), B(−3, −1) and C(5, −5) as shown in the diagram.

The broken line represents the perpendicular bisector of BC.

(a) Show that the equation of the perpendicular bisector of BC is $y = 2x − 5$.

4

(b) Find the equation of the median from C.

3

(c) Find the coordinates of the point of intersection of the perpendicular bisector of BC and the median from C.

3

Find the equation of the line through the point (−1, 4) which is parallel to the line with equation $3x − y + 2 = 0$.

3