exercise 6.2

1 Find the distance between A and B for each of the line intervals AB in question **1** of Exercise **6.1**

2 For each of these pairs of points

i draw the points on the Cartesian plane.

ii find the distance between the points.

a $(3, 6)$ and $(9, 6)$ **b** $(4, 3)$ and $(12, 3)$ **c** $(5, 8)$ and $(5, 2)$

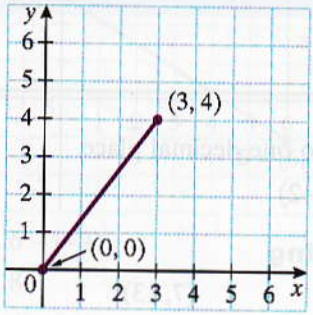
d $(-4, 1)$ and $(-8, 1)$ **e** $(-6, 0)$ and $(4, 0)$ **f** $(-5, 2)$ and $(-5, -4)$

g $(0, -5)$ and $(0, 7)$ **h** $(3, 2)$ and $(-7, 2)$ **i** $(3, 4)$ and $(3, 9)$

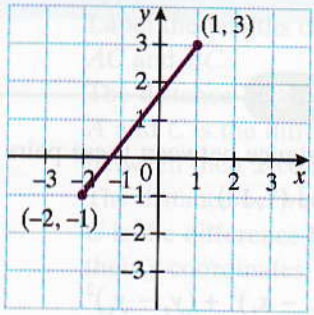
j $(-4, -3)$ and $(5, -3)$ **k** $(4, 3)$ and $(11, 3)$ **l** $(-3, -6)$ and $(-3, -10)$

3 Find the distance between each pair of points by first drawing a right-angled triangle and finding the length of the two shorter sides. Then use Pythagoras' theorem to calculate the hypotenuse.

a



b



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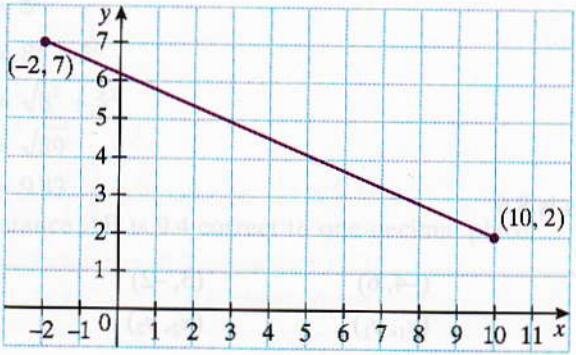
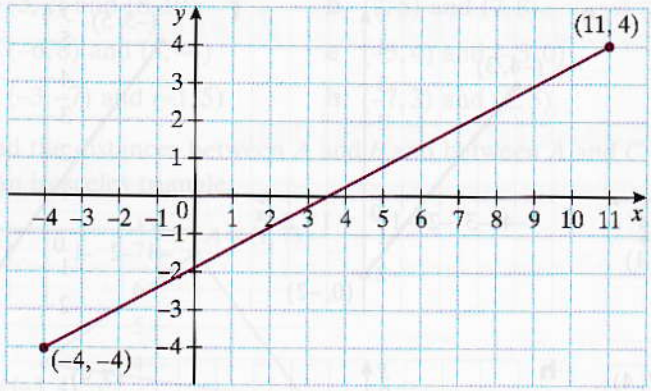


d



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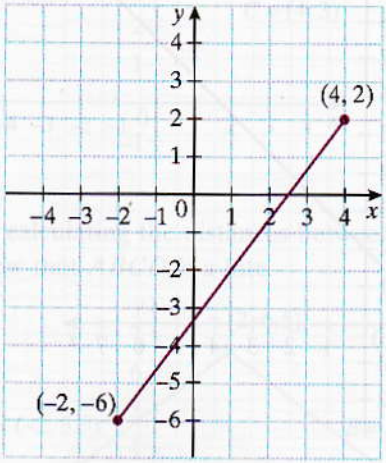

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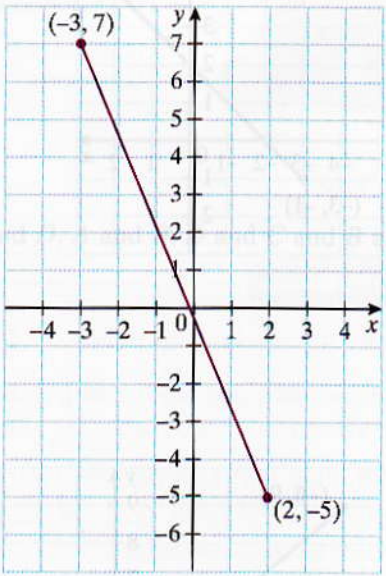
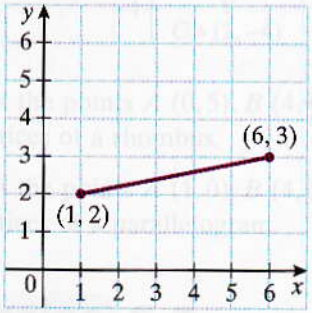
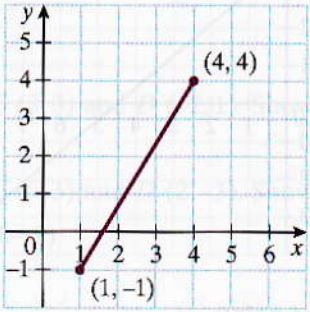


4 Find the distance between these pairs of points, correct to one decimal place by first drawing a right-angled triangle and finding the length of the two shorter sides. Then use Pythagoras' theorem to calculate the hypotenuse.

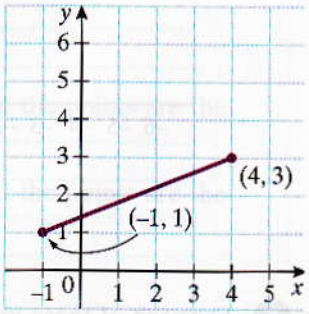
a



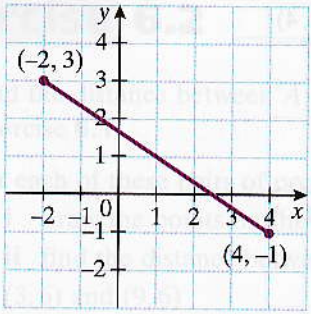
b



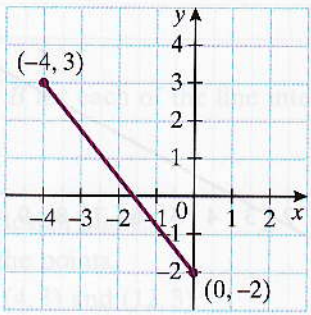
c



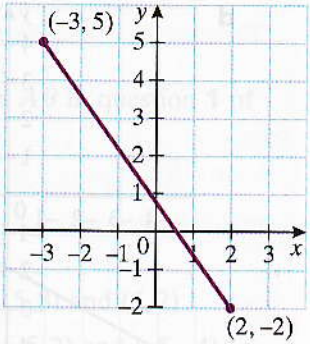
d



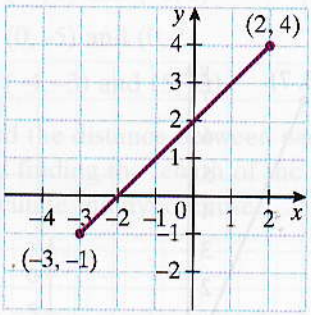
e



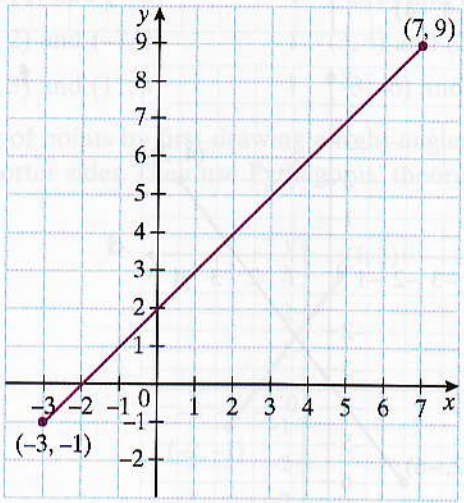
f



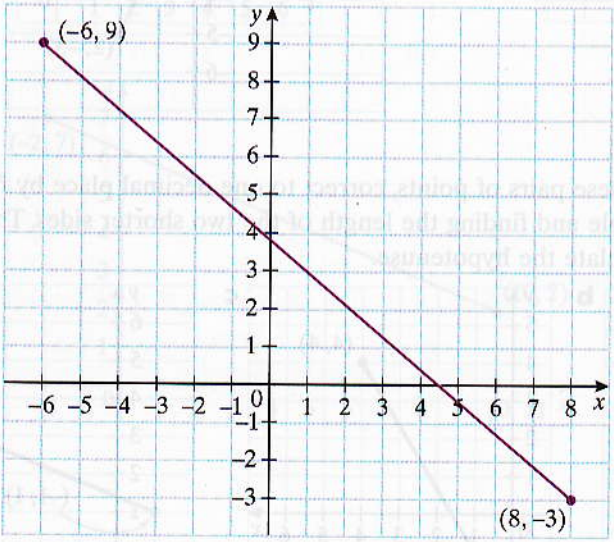
g



h



i



5 For each of these pairs of points,

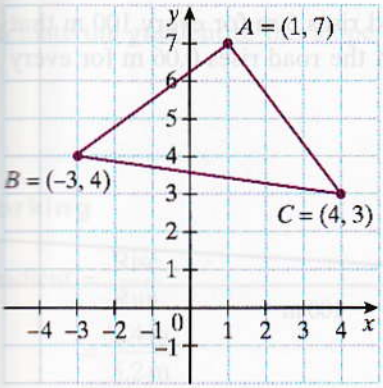
- **i** draw a diagram to show the points on the Cartesian plane.
- **ii** calculate the distance between the points. Give each distance correct to one decimal place.

a (3, 2) and (8, 10) **b** (2, 5) and (7, 8) **c** (–1, –3) and (4, 7)

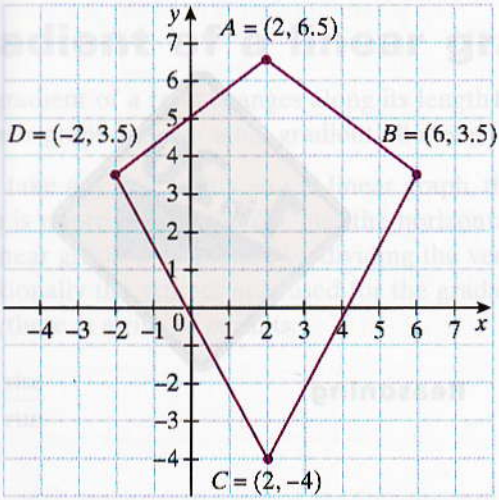
d (–6, 8) and (5, –4) **e** (–3, 4) and (–5, 0) **f** (2, –5) and (–6, 3)

g (–3, –7) and (–1, 5) **h** (–7, 3) and (2, 5) **i** (0, –7) and (8, 3)

6 Find the distances between A and B and between A and C and, hence, show that ABC is an isosceles triangle.



7 By calculating the distances between points A and D, A and B, D and C and B and C, show that $ABCD$ is a kite.



8 Plot the points A (0, 5), B (4, 7), C (2, 3) and D (–2, 1). Show that the points are the vertices of a rhombus.

9 Plot the points A (1, 0), B (4, 6), C (5, 3) and D (2, –3). Show that the points are the vertices of a parallelogram.

exercise 6.2 challenge

10 Plot the points A (2, 4), B (11, 16) and C (18, –8). Show that the points are the vertices of a right-angled triangle.

exercise 6.2

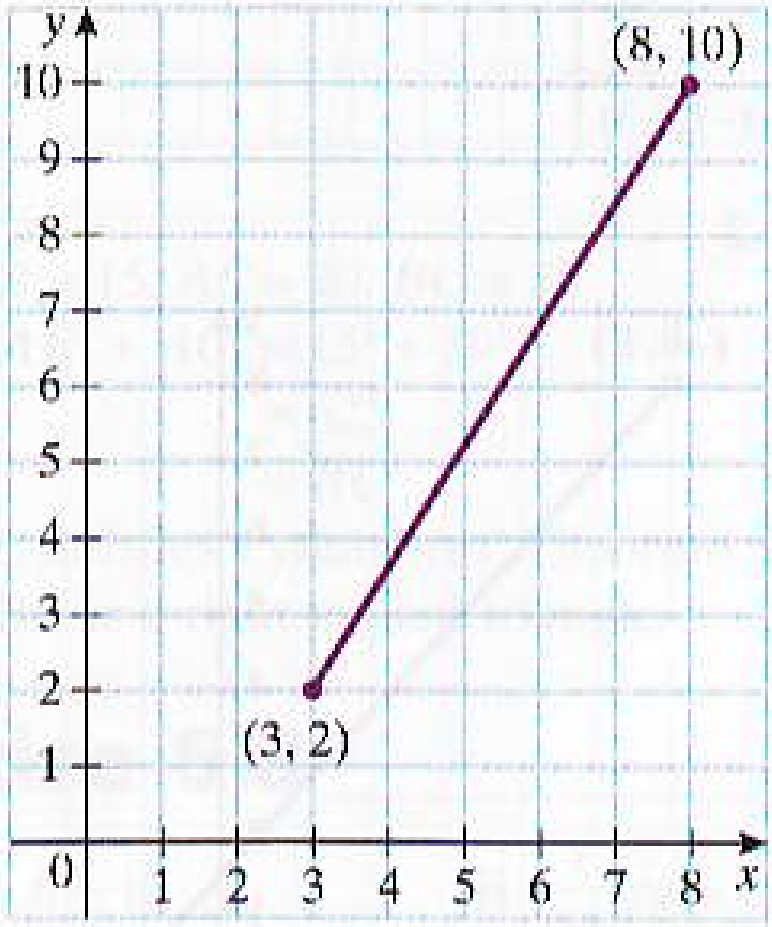
1 **a** 8 **b** 6 **c** 4 **d** 7
e 8 **f** 6

2 **a** 6 **b** 8 **c** 6 **d** 4
e 10 **f** 6 **g** 12 **h** 10
i 5 **j** 9 **k** 7 **l** 4

3 **a** 5 **b** 5 **c** 13 **d** 17
e 10 **f** 13

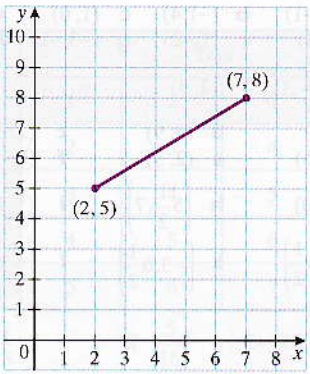
4 **a** 5.1 **b** 5.8 **c** 5.4 **d** 7.2
e 6.4 **f** 8.6 **g** 7.1 **h** 14.1
i 18.4

5 **a** **i**



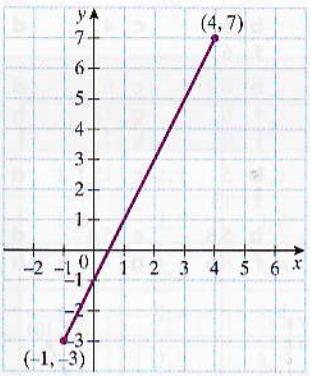
ii 9.4

b i



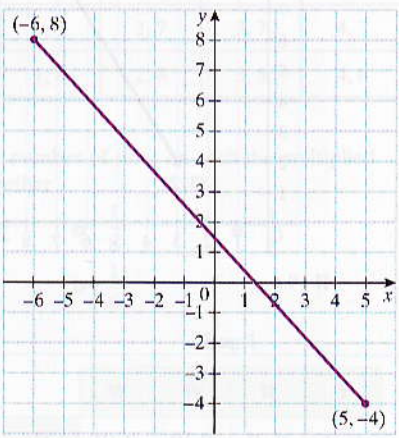
ii 5.8

c i



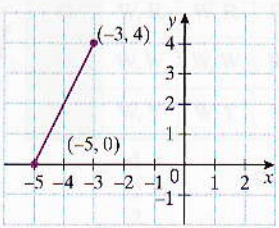
ii 11.2

d i



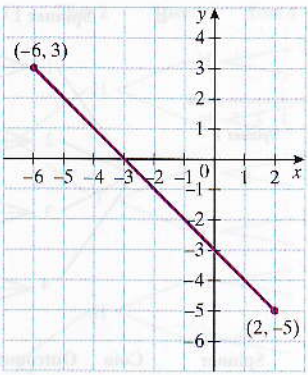
ii 16.3

e i



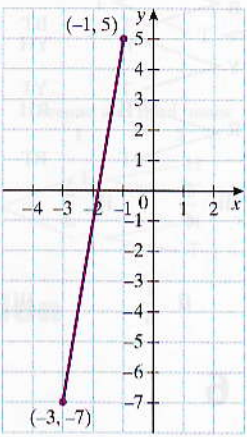
ii 4.5

f i



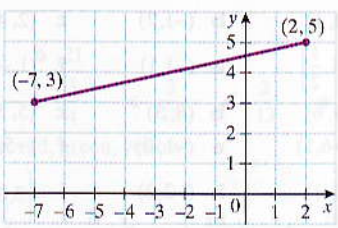
ii 11.3

g i



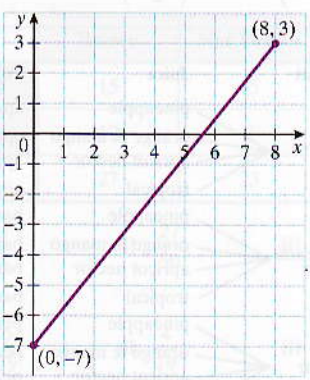
ii 12.2

h i



ii 9.2

i i

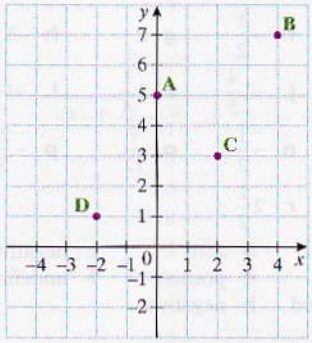


ii 12.8

6 $AB = 5$ and $AC = 5$ therefore ABC is an isosceles triangle because at least two sides are equal.

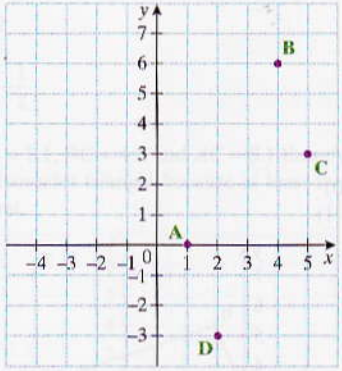
7 $AD = 5$, $AB = 5$, $DC \approx 8.5$, $BC \approx 8.5$ therefore $ABCD$ is a kite because it has two pairs of adjacent equal sides..

8 **a**



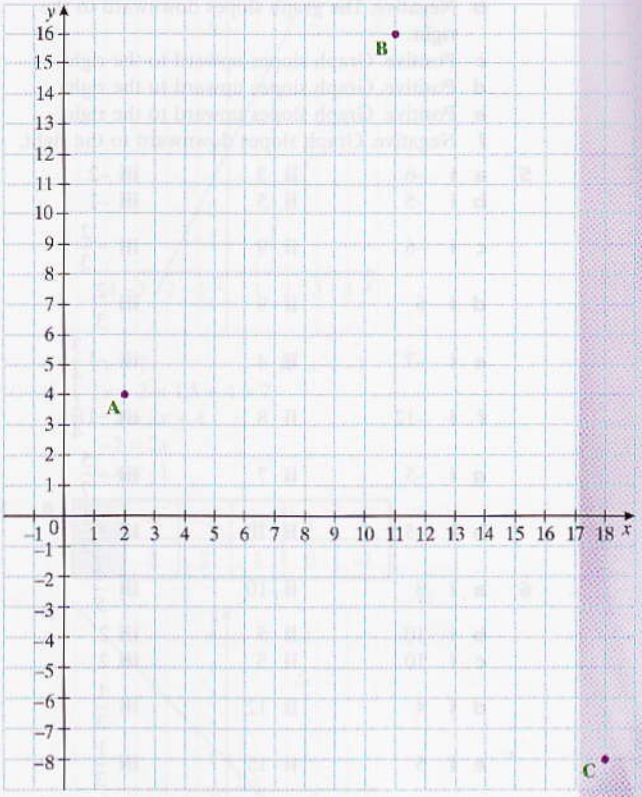
b $AD \approx 4.5$, $AB \approx 4.5$, $DC \approx 4.5$, $BC \approx 4.5$ therefore $ABCD$ is a rhombus because it has four equal sides.

9 **a**



b $AD \approx 3.2$, $AB \approx 6.7$, $DC \approx 6.7$, $BC \approx 3.2$ therefore $ABCD$ is a parallelogram because opposite sides are equal.

10 **a**



b $AB = 15$, $AC = 20$, $BC = 25$

$AB^2 + AC^2 = 15^2 + 20^2$

$= 625$

$= BC^2$

So, satisfies Pythagoras' Theorem. Therefore ABC is a right-angled triangle.

exercise 6.3