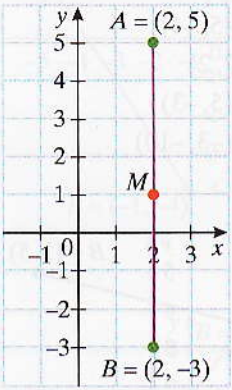
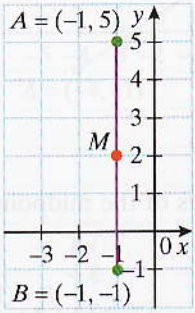
exercise 6.1

1 Write the coordinates of M, the midpoint of AB.

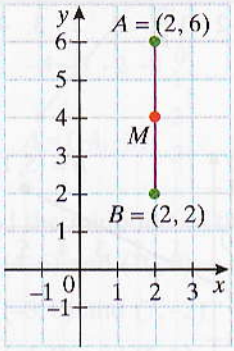
a



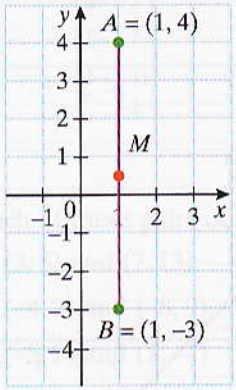
b



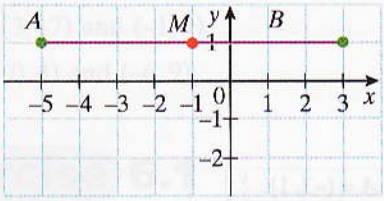
c



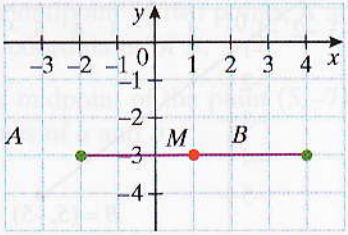
d



e



f

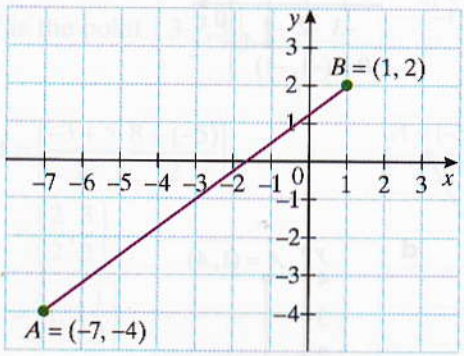


2 Find the midpoint of the line segment joining each of the following pairs of points.

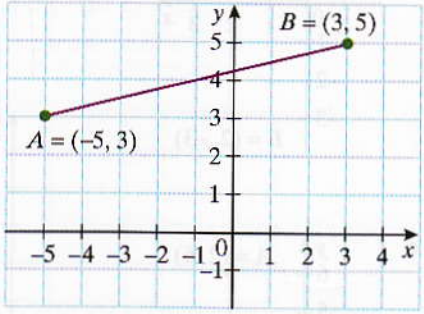
a $(3, 6)$ and $(9, 6)$
b $(4, 3)$ and $(12, 3)$
c $(5, 8)$ and $(5, 2)$
d $(-4, 1)$ and $(-8, 1)$
e $(-6, 0)$ and $(4, 0)$
f $(-5, 2)$ and $(-5, -4)$
g $(0, -5)$ and $(0, 7)$
h $(3, 2)$ and $(-7, 2)$
i $(3, 4)$ and $(3, 9)$
j $(-4, -3)$ and $(5, -3)$
k $(4, 3)$ and $(11, 3)$
l $(-3, -6)$ and $(-3, -10)$

3 Find the coordinates of the midpoint of AB.

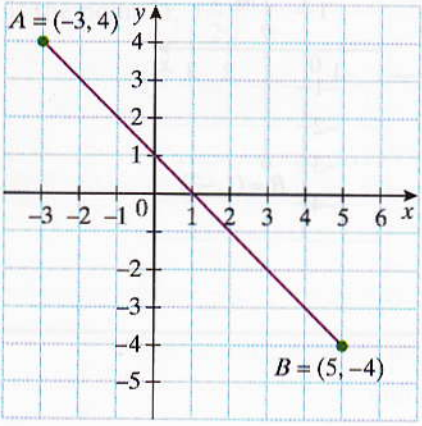
a



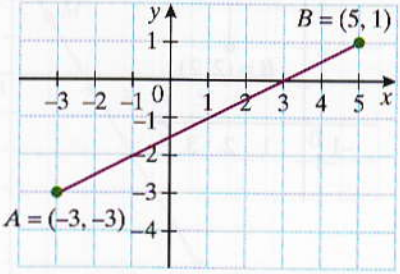
b



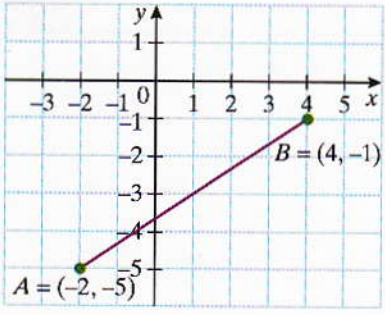
c



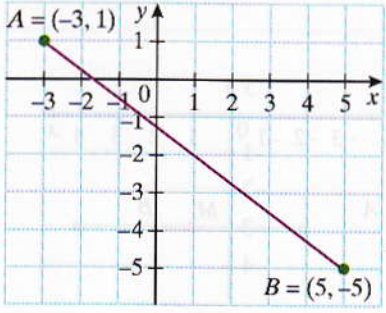
d



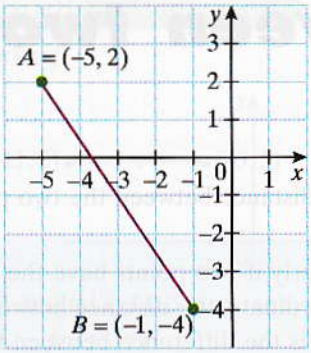
e



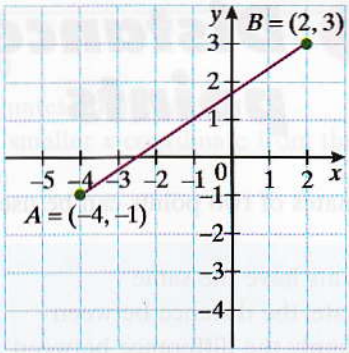
f



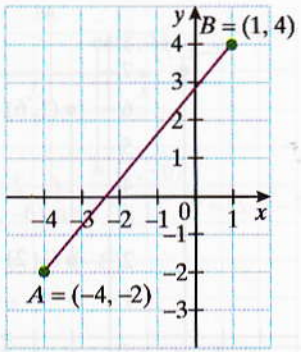
g



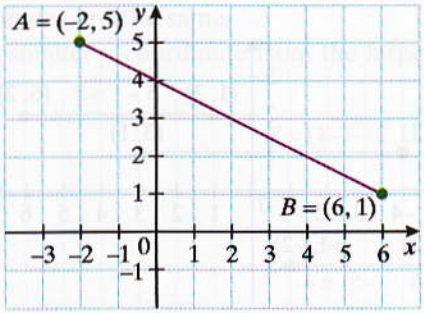
h



i



j



4 Find the midpoint of the line segment joining each of these pairs of points.

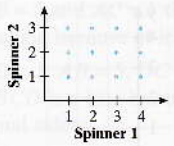
a (4, 6) and (10, 8)
b (3, 5) and (7, 13)
c (−3, 8) and (7, −2)
d (−4, 3) and (−8, 9)
e (−1, 0) and (5, 6)
f (−5, 2) and (5, −4)
g (−3, −7) and (−5, 7)
h (3, 4) and (8, 10)
i (3, −7) and (−1, 9)
j (−4, 5) and (5, 8)
k (0, 4) and (−6, 9)
l (−10, −6) and (4, −1)

exercise 6.1 challenge

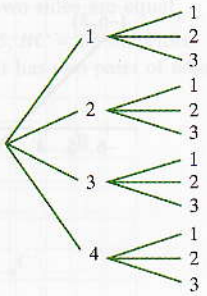
5 The midpoint of two points, A and B, is the point $(-4, 6)$. If A is the point $(3, -11)$, find the coordinates of B.

6 The midpoint of the point $(5, -7)$ and the point (a, b) is the point $(-9, -5)$. Find the values of a and b.

11 **a**

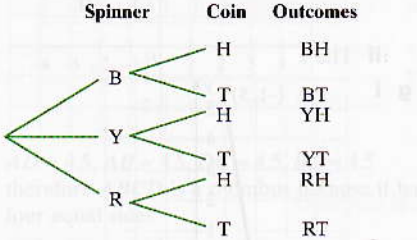


b



c $\frac{1}{3}$

12 **a**



b **i** $\frac{1}{6}$ **ii** $\frac{1}{6}$ **iii** $\frac{2}{3}$ **iv** 0

13 **a** See below

b **i** $\frac{1}{12}$ **ii** $\frac{1}{4}$ **iii** $\frac{1}{3}$

Chapter 6

exercise 6.1

1 **a** $(2, 1)$ **b** $(-1, 2)$ **c** $(2, 4)$
d $\left(1, \frac{1}{2}\right)$ **e** $(-1, 1)$ **f** $(1, -3)$

2 **a** $(6, 6)$ **b** $(8, 3)$ **c** $(5, 5)$
d $(-6, 1)$ **e** $(-1, 0)$ **f** $(-5, -1)$
g $(0, 1)$ **h** $(-2, 2)$ **i** $\left(3, 6\frac{1}{2}\right)$
j $\left(\frac{1}{2}, -3\right)$ **k** $\left(7\frac{1}{2}, 3\right)$ **l** $(-3, -8)$

3 **a** $(-3, -1)$ **b** $(-1, 4)$ **c** $(1, 0)$ **d** $(1, -1)$
e $(1, -3)$ **f** $(1, -2)$ **g** $(-3, -1)$ **h** $(-1, 1)$
i $\left(-1\frac{1}{2}, 1\right)$ **j** $(2, 3)$

4 **a** $(7, 7)$ **b** $(5, 9)$ **c** $(2, 3)$
d $(-6, 6)$ **e** $(2, 3)$ **f** $(0, -1)$
g $(-4, 0)$ **h** $\left(5\frac{1}{2}, 7\right)$ **i** $(1, 1)$
j $\left(\frac{1}{2}, 6\frac{1}{2}\right)$ **k** $\left(-3, 6\frac{1}{2}\right)$ **l** $\left(-3, -3\frac{1}{2}\right)$

5 $(-11, 23)$

6 $a = -23$, $b = -3$

exercise 6.2

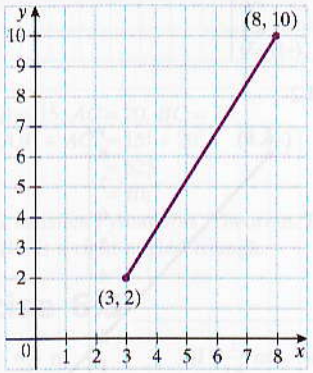
1 **a** 8 **b** 6 **c** 4 **d** 7
e 8 **f** 6

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