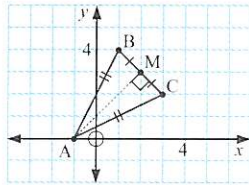


EXERCISE 6D

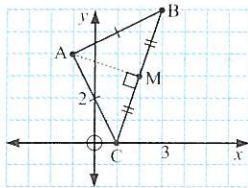
- a** 8 **b** The sprinter's speed is 8 m s^{-1} .
c The speed is constant as the gradient is constant.
- a** 72 km h^{-1} **b** **i** 85 km h^{-1} **ii** 85 km h^{-1}
c O to A (0 to 2 hours) and B to C (5 to 7 hours)
- a** If no hours are worked then no wages are received.
b gradient is 15; the wage is £15 per hour
c **i** £90 **ii** £270
- a** A has gradient $\frac{35}{3} = 11\frac{2}{3}$, B has gradient $\frac{75}{8} = 9\frac{3}{8}$
b Gradient is number of km travelled per litre of petrol.
c \$25.98
- a** \$3 initial charge
b AB has gradient $\frac{3}{2}$, BC has gradient $\frac{3}{5}$, these values give the charge per km.
c gradient is $\frac{6}{5}$, average charge is \$1.20 per km.

EXERCISE 6E

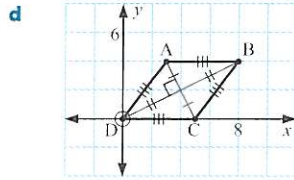
- a** $AB = \sqrt{20}$ units, $BC = \sqrt{8}$ units, $AC = \sqrt{20}$ units
 $AB = AC$ so the triangle is isosceles.
b M(2, 3)
c gradient of [AM] = 1, gradient of [BC] = -1
 Gradients are -ve reciprocals so [AM] \perp [BC]



- a** gradient [AB] = 0, gradient [DC] = 0 \therefore [AB] \parallel [DC]
 gradient [AD] = $\frac{9}{15}$, gradient [BC] = $\frac{9}{15}$ \therefore [AD] \parallel [BC]
 \therefore ABCD is a parallelogram.
b $AB = DC = 9$ units, $BC = AD = \sqrt{306}$ units
c **i** $(4, 2\frac{1}{2})$ **ii** $(4, 2\frac{1}{2})$
d The diagonals of a parallelogram bisect each other.
- a** M(3, 2), N(4, -1), gradient MN = gradient AC = -3
b $MN = \sqrt{10}$ units, $AC = \sqrt{40} = 2\sqrt{10}$ units
- a** $AB = \sqrt{20}$ units, $AC = \sqrt{20}$ units, $BC = \sqrt{40}$ units
 $AB = AC$ and $AB^2 + AC^2 = BC^2$
 \therefore isosceles and right angled at A
b M(2, 3)
c gradient [AM] = $-\frac{1}{3}$, gradient [BC] = 3
 gradients are negative reciprocals so [AM] \perp [BC].
d



- a** $AB = BC = CD = DA = 5$ units \therefore ABCD is a rhombus
b midpoint [AC] = midpoint [BD] = (4, 2)
c gradient [AC] = -2, gradient [BD] = $\frac{1}{2}$
 gradients are negative reciprocals so [AC] \perp [BD]



EXERCISE 6F

- a** gradient is undefined **b** gradient is 0 **c** gradient is undefined
- d** gradient is 0 **e** gradient is undefined **f** gradient is 0
- a** $y = 2$ **b** $x = 3$ **c** $y = 0$ **d** $y = -3$
e $x = -7$ **f** $y = -4$

EXERCISE 6G.1

- a** $m = 3, c = 2$ **b** $m = 7, c = 5$ **c** $m = -2, c = 1$
d $m = \frac{1}{3}, c = 6$ **e** $m = -1, c = 6$ **f** $m = -2, c = 3$
g $m = -1, c = 10$ **h** $m = \frac{1}{2}, c = 1$ **i** $m = \frac{3}{2}, c = 2$
j $m = 0, c = 0$ **k** $m = -\frac{1}{2}, c = \frac{3}{2}$ **l** $m = -\frac{1}{2}, c = \frac{7}{4}$
- a** $y = x - 1$ **b** $y = \frac{1}{2}x + 1$ **c** $y = -2x + 2$
d $y = -x$ **e** $y = \frac{1}{3}x$ **f** $y = 3x - 1$

EXERCISE 6G.2

- a**

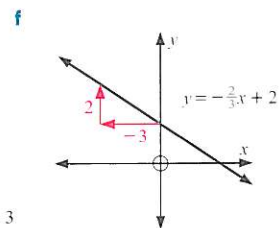
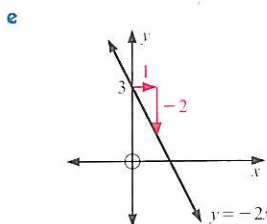
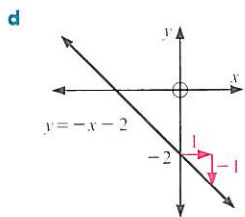
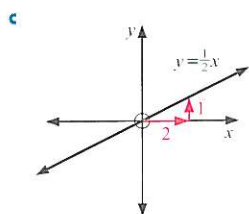
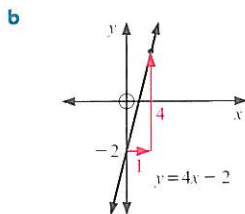
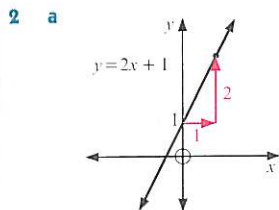
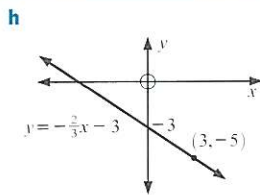
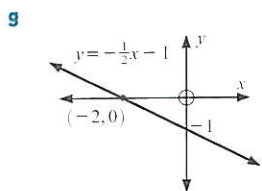
b

c

d

e

f



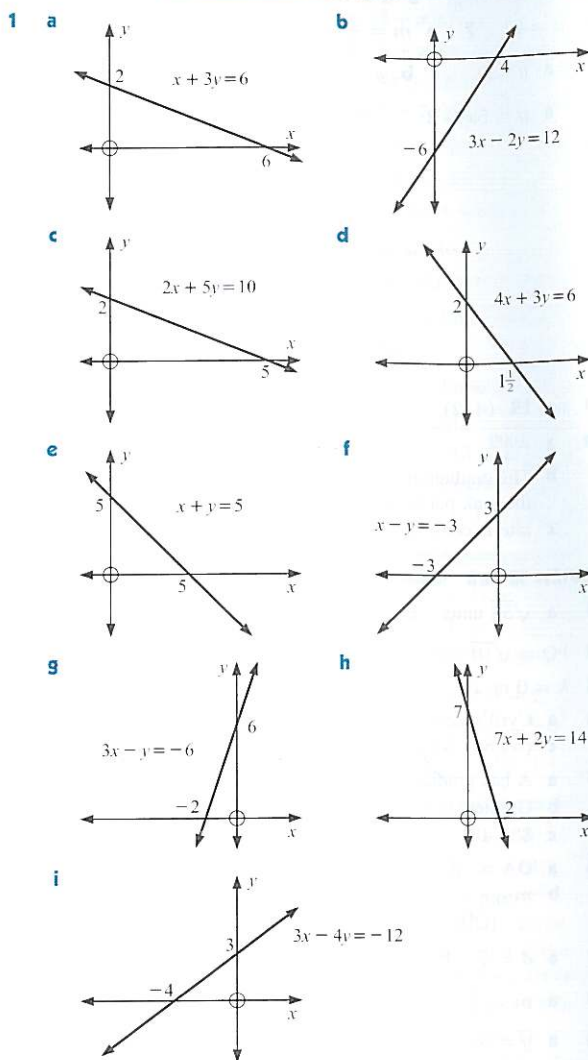
EXERCISE 6G.3

- 1** a $y = 2x + 1$ b $y = -x + 1$ c $y = -3x + 10$
 d $y = \frac{2}{3}x + \frac{7}{3}$ e $y = -\frac{1}{2}x - \frac{1}{2}$ f $y = -3$
 g $y = \frac{2}{3}x + \frac{17}{3}$ h $y = -\frac{1}{5}x + \frac{6}{5}$ i $y = -\frac{3}{4}x + \frac{3}{2}$
 j $y = \frac{4}{7}x - \frac{26}{7}$
- 2** a $y = 2x - 4$ b $y = -x + 4$ c $y = 6x + 16$
 d $y = -9x + 6$ e $y = -\frac{1}{3}x - \frac{7}{3}$ f $y = -3x - 7$
- 3** a $y = -\frac{1}{2}x + 4$ b $y = 3x + 1$ c $y = -\frac{3}{4}x + 3$
 d $y = -\frac{5}{4}x - \frac{5}{2}$ e $y = -2x - 2$ f $y = \frac{1}{3}x - \frac{7}{3}$

EXERCISE 6H.1

- 1** a $x - 3y = -11$ b $3x - 5y = -11$
 c $2x + 3y = 12$ d $4x - 5y = 21$
 e $3x - y = -10$ f $2x + y = 5$
- 2** a $x - y = 4$ b $x + y = 4$ c $x = -2$
 d $9x + y = 6$ e $3x - y = -5$ f $x + y = -5$
- 3** a 2 b 0 c -3 d undefined e -4
 f $\frac{2}{3}$ g $\frac{3}{4}$ h $-\frac{3}{5}$ i -3 j $-\frac{2}{3}$ k $-\frac{3}{5}$
 l $-\frac{4}{7}$ m $\frac{1}{2}$ n $\frac{3}{4}$ o $\frac{5}{6}$

EXERCISE 6H.2



EXERCISE 6I

- 1** a yes b no c yes **2** a $k = -4$ b $k = 1$
- 3** a $a = 7$ b $a = 9$ c $a = 5$ d $a = 7$
- 4** a $b = -3$ b $b = -\frac{9}{4}$ c $b = -\frac{7}{5}$ d $b = \frac{5}{4}$
 e $b = 3$ f $b = \frac{2}{3}$

EXERCISE 6J

- 1** a (-1, 2) b (2, 4) c (3, 1) d (-2, 3) e (0, 6)
 f (-1, 2) g (2, 1) h no point of intersection
 i infinitely many points of intersection
- 2** a None, as the lines are parallel.
 b Infinitely many, as the lines are coincident.
 c If $k = 5$, infinitely many, as the lines are coincident;
 if $k \neq 5$, none, as the lines are parallel.

REVIEW SET 6A

- 1** a $2\sqrt{17}$ units b (2, 2) c -4 d C(-1, 14)
- 2** $a = -2$ or 4
- 3** $PQ = PR = \sqrt{20}$ units, $QR = 4$ units, isosceles triangle