

# 1:10 | Coordinate Geometry

## Exercise 1:10

- 1** Find the gradient of the line that passes through the points:
- a (1, 2) and (1, 3)
  - b (1, 7) and (0, 0)
  - c (-3, -2) and (5, -2)
- 2** Find the midpoint of the interval joining:
- a (2, 6) and (8, 10)
  - b (-3, 5) and (4, -2)
  - c (0, 0) and (7, 0)
- 3**
- a Find the distance between (1, 4) and (5, 2).
  - b A is the point (-5, 2). B is the point (-2, -6). Find the distance AB.
  - c Find the distance between the origin and (6, 8).
  - d Find the distance AB between A(-2, 1) and B(5, 3).



- 4** Sketch each of these lines on a number plane.
- a  $y = 3x + 4$
  - b  $2x + 3y = 12$
  - c  $y = -3x$
  - d  $x = 2$

- 5** Find the gradient and y-intercept of the lines:
- a  $y = 3x + 5$
  - b  $y = -x - 2$
  - c  $y = -2x + 5$

- 6** Write each equation in question 4 in the *general form*.

- 7** Write the equation of the line that has:
- a gradient 5 and y-intercept -2
  - b gradient 0 and y-intercept 4
  - c gradient 2 and passes through (0, 5)
  - d gradient -1 and passes through (-2, 3).

- 8** Write the equation of the line that passes through:
- a (2, 1) and (4, 2)
  - b (-1, 5) and (3, 1)

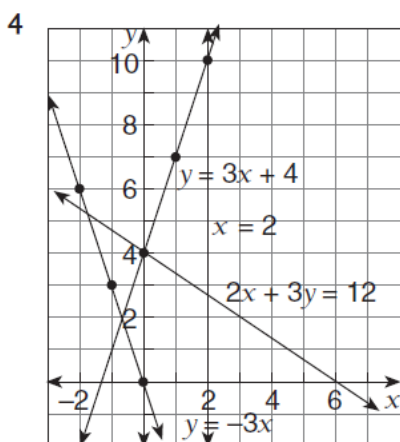


- 9** a Which of the lines  $y = 3x$ ,  $2x + y = 3$  and  $y = 3x - 1$  are parallel?  
 b Are the lines  $y = 2x - 1$  and  $y = 2x + 5$  parallel?  
 c Show that the line passing through  $(1, 4)$  and  $(4, 2)$  is parallel to the line passing through  $(-4, 0)$  and  $(-1, -2)$ .  
 d Which of these lines are parallel to the  $y$ -axis?  
 $\{y = 4, y = x + 1, x = 7, y = 5x - 5, x = -2\}$
- 10** a Are  $y = 4x$  and  $y = \frac{1}{4}x - 2$  perpendicular?  
 b Are  $y = 3$  and  $x = 4$  perpendicular?  
 c Which of the lines  $y = -x + 1$ ,  $y = \frac{1}{2}x - 1$  and  $y = x - 7$  are perpendicular?  
 d Show that the line passing through  $(0, -5)$  and  $(-3, -4)$  is perpendicular to  $y = 3x - 8$
- 11** Sketch the regions corresponding to the inequations.  
 a  $x > 2$                       b  $y \leq -1$                       c  $x + y < 2$   
 d  $y \geq 2x$                       e  $y < x - 1$                       f  $2x + 3y \geq 6$
- 12** a Graph the region described by the *intersection* of  $y > x + 1$  and  $y < 3$ .  
 b Graph the region described by the *union* of  $y > x + 1$  and  $y < 3$ .

## Answers:

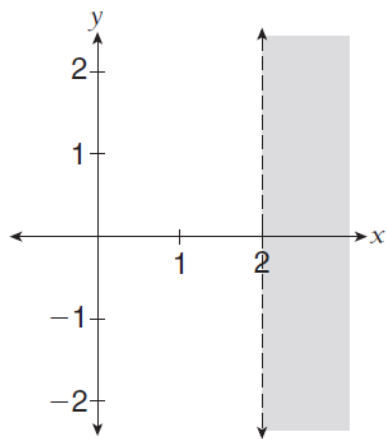
### Exercise 1:10

- 1 a 1                      b 7                      c 0                      2 a  $(5, 8)$                       b  $(\frac{1}{2}, 1\frac{1}{2})$                       c  $(3\frac{1}{2}, 0)$   
 3 a  $\sqrt{20}$  units                      b  $\sqrt{73}$  units                      c 10 units                      d  $\sqrt{53}$  units

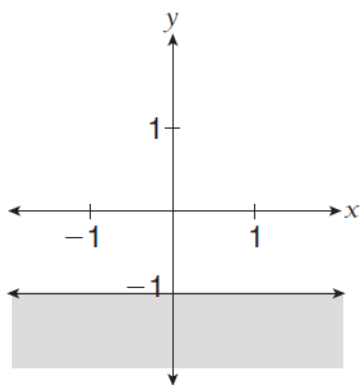


- 5 a gradient = 3,  $y$ -intercept = 5                      b gradient = -1,  $y$ -intercept = -2  
 c gradient = -2,  $y$ -intercept = 5
- 6 a  $y = 3x + 4$                       b  $y = -\frac{2}{3}x + 4$                       c  $y = -3x$                       d  $x = 2$
- 7 a  $y = 5x - 2$                       b  $y = 4$                       c  $y = 2x + 5$                       d  $y = -x + 1$
- 8 a  $y = \frac{1}{2}x$                       b  $y = -x + 4$
- 9 a  $y = 3x$  and  $y = 3x - 1$                       b yes  
 c  $m_1 = \frac{2-4}{4-1} = \frac{-2}{3}$                       d  $x = 7$  and  $x = -2$   
 $m_2 = \frac{-2-0}{-1-(-4)} = \frac{-2}{3}$   
 $\therefore$  The lines are parallel.
- 10 a yes                      b yes                      c  $y = -x + 1$  and  $y = x + 7$   
 d Gradient of line through  $(0, -5)$  and  $(-3, -4)$   
 is  $m_1 = \frac{-4-(-5)}{-3-0} = \frac{1}{-3}$  .  $m_2 = 3$   
 Now  $m_1 \times m_2 = -\frac{1}{3} \times 3 = -1$   
 $\therefore$  The lines are perpendicular.

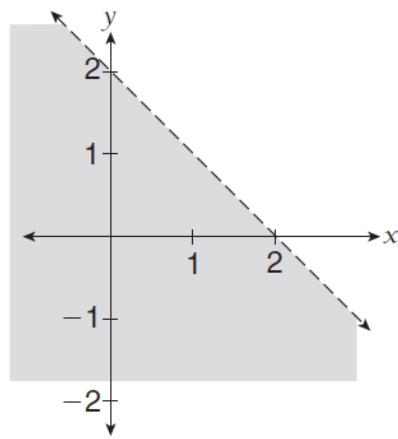
11 a



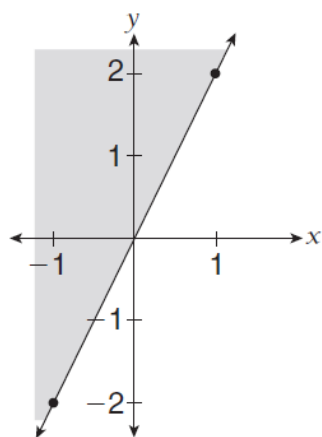
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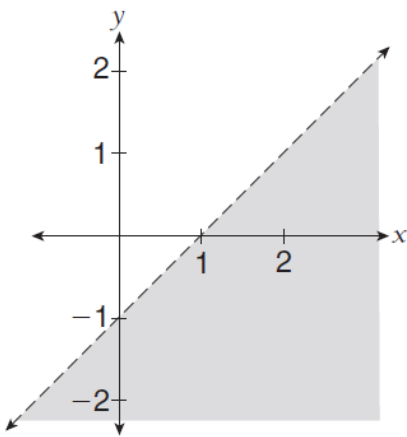
c



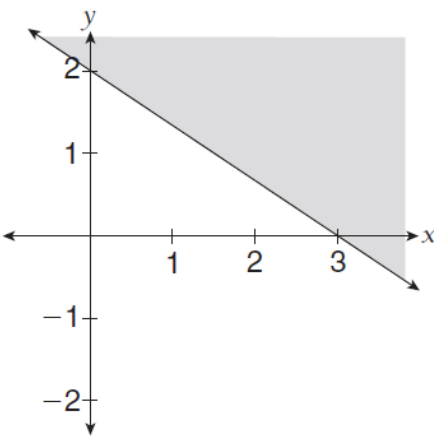
d



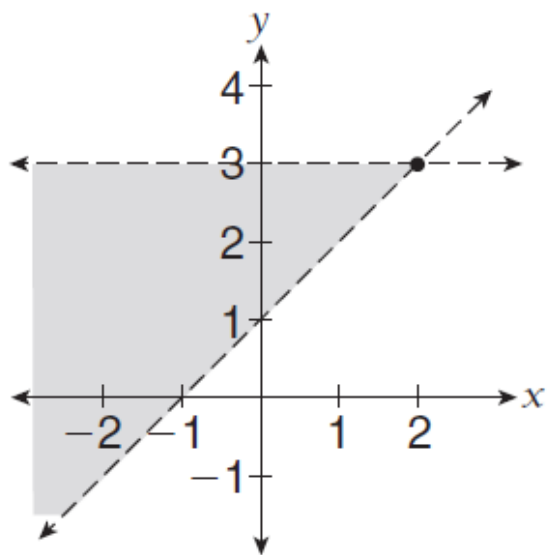
e



f



12 a



b

