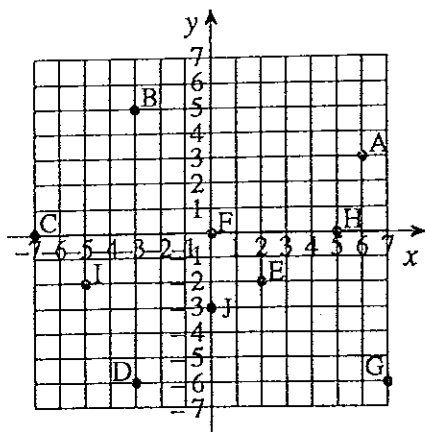


# LEVEL 1 — COORDINATE GEOMETRY

Note: Only turn back to page number if you have difficulty

Page

Q1.



Name the coordinates of the points:

75

- |       |       |
|-------|-------|
| (a) A | (f) F |
| (b) B | (g) G |
| (c) C | (h) H |
| (d) D | (i) I |
| (e) E | (j) J |

Q2. Find the midpoint of the interval joining:

76

- |                         |                          |
|-------------------------|--------------------------|
| (a) (2, 3) and (6, 9)   | (b) (4, 5) and (2, 1)    |
| (c) (7, -3) and (0, 7)  | (d) (-5, 2) and (9, -4)  |
| (e) (-6, -1) and (5, 3) | (f) (1, -8) and (-4, -3) |

Q3. Find the distance between the points:

77

- |                         |                          |
|-------------------------|--------------------------|
| (a) (4, 3) and (2, 9)   | (b) (6, 1) and (-3, 5)   |
| (c) (-1, 4) and (2, -8) | (d) (2, -3) and (-1, -4) |
| (e) (5, -8) and (-7, 2) | (f) (0, -3) and (8, 0)   |

Q4. Find the gradient of the line passing through:

78

- |                         |                          |
|-------------------------|--------------------------|
| (a) (0, 0) and (6, 3)   | (b) (5, 1) and (2, 6)    |
| (c) (-2, 0) and (7, 1)  | (d) (-4, 1) and (-2, -4) |
| (e) (6, -6) and (-1, 3) | (f) (8, -2) and (-5, 2)  |

Q5. Graph these lines:

79, 80

- |                  |                  |              |
|------------------|------------------|--------------|
| (a) $y = 2x + 1$ | (b) $x = 5$      | (c) $y = x$  |
| (d) $y = 3 - x$  | (e) $y = 4x - 5$ | (f) $y = -3$ |

Q6. Find the gradient and y-intercept of the following lines, then sketch each line:

81, 82

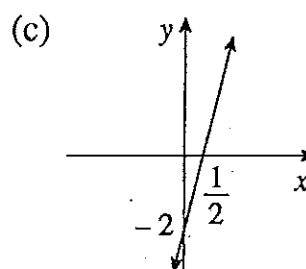
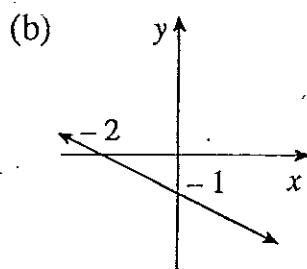
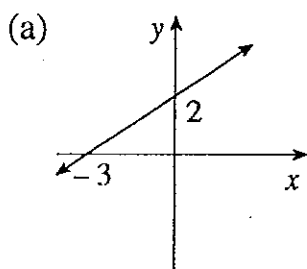
- |                            |                   |                            |
|----------------------------|-------------------|----------------------------|
| (a) $y = 5x - 2$           | (b) $y = -2x + 3$ | (c) $y = \frac{3}{2}x - 4$ |
| (d) $y = 1 - \frac{1}{2}x$ | (e) $y = -x$      | (f) $y = \frac{1}{2} - x$  |

## LEVEL 1 — COORDINATE GEOMETRY CONT.

Note: Only turn back to page number if you have difficulty	Page
<p>Q7. Write the following equations in the form <math>y = mx + b</math>, and hence find the gradient and <math>y</math>-intercept of each one:</p> <p>(a) <math>2x - y + 3 = 0</math>      (b) <math>4x + 2y - 6 = 0</math>      (c) <math>3x - 3y + 2 = 0</math>            (d) <math>x + 5y = 0</math>      (e) <math>2x - 3y + 1 = 0</math>      (f) <math>x - 4y = 4</math></p>	84
<p>Q8. Find the equation of a straight line with:</p> <p>(a) a gradient of 3 and passing through the point (4, 3)            (b) a gradient of <math>-2</math> and passing through the point (2, 7)            (c) a gradient of 5 and passing through the point <math>(-3, 5)</math>            (d) a gradient of <math>-\frac{1}{2}</math> and passing through the point (5, <math>-2</math>)            (e) a gradient of <math>\frac{2}{3}</math> and passing through the point <math>(-4, 3)</math></p>	85
<p>Q9. Find the equation of the straight line which passes through the points:</p> <p>(a) (2, 1) and (5, 7)      (b) (1, 3) and (4, <math>-3</math>)      (c) (4, <math>-8</math>) and (0, 8)            (d) <math>(-1, -1)</math> and (1, 5)      (e) <math>(-2, 7)</math> and (6, <math>-5</math>)      (f) <math>(-3, -4)</math> and (9, 2)</p>	86
<p>Q10. Which of the following lines are parallel to <math>y = 2x - 5</math>:</p> <p><math>2x + y - 2 = 0</math>, <math>2x - 3y + 2 = 0</math>, <math>2x - y + 1 = 0</math>, <math>4x - 2y + 3 = 0</math></p>	87
<p>Q11. Find the equation of the line which cuts the <math>y</math>-axis at <math>-3</math> and is parallel to <math>4x - y + 1 = 0</math>.</p>	87
<p>Q12. Which of the following lines are perpendicular to <math>y = -3x + 2</math>:</p> <p><math>3y - x + 3 = 0</math>, <math>3x + y - 2 = 0</math>, <math>6y - 2x + 4 = 0</math>, <math>3x - 3y + 3 = 0</math></p>	88
<p>Q13. Find the equation of the line which is perpendicular to <math>y = \frac{2}{3}x - 1</math> and has <math>y</math>-intercept 5.</p>	88
<p>Q14. Which of the following points lie on the line <math>4x - y + 3 = 0</math></p> <p>(3, 15) <math>(-5, -15)</math> (8, 35) <math>(-8, -35)</math> (4, 19)</p>	89
<p>Q15. Show that the points <math>(-4, -5)</math>, <math>(2, -2)</math> and <math>(8, 1)</math> are collinear.</p>	90

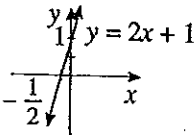
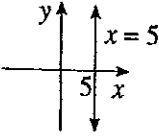
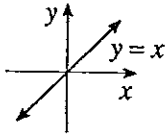
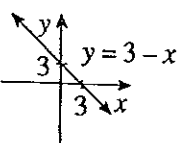
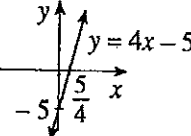
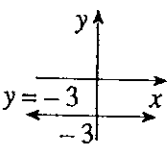
## LEVEL 2 — COORDINATE GEOMETRY

Q1. Find the equation of each line below:



- Q2. Find the equation of the straight line passing through the midpoint of the interval joining  $(6, 2)$  and  $(-2, 4)$ , and the origin.
- Q3. The midpoint of an interval is  $(2, 4)$ . If the coordinates at the ends of the interval are  $(m, 5)$  and  $(8, n)$ , find  $m$  and  $n$ .
- Q4. A and B are the points  $(-3, 4)$  and  $(6, -2)$  respectively. If M is the midpoint of AB, find the distance BM.
- Q5. Find the equation of the line which passes through the point  $(6, -4)$  and is parallel to the line  $2x - 3y + 3 = 0$ .
- Q6. Find the equation of the line which passes through the points  $P(0, a)$  and  $Q(a, 2a)$ .
- Q7. Find the equation of the line perpendicular to  $5x + 2y - 1 = 0$ , and passing through the point  $(-2, 7)$ .
- Q8. Show that the triangle whose vertices are  $A(3, 6)$ ,  $B(-2, -4)$  and  $C(-5, 2)$  is a right angled triangle. Find the area of the triangle.
- Q9. Prove that a quadrilateral ABCD with vertices  $A(-1, 4)$ ,  $B(-3, 3)$ ,  $C(1, 2)$  and  $D(3, 3)$  is a parallelogram.
- Q10. The vertices of a quadrilateral are  $A(-2, 3)$ ,  $B(5, 4)$ ,  $C(4, -3)$  and  $D(-3, -4)$ . Prove that ABCD is a rhombus. Find the area of ABCD.
- Q11. Find the equation of the straight line passing through the point  $(-2, 1)$  and through the point of intersection of  $4x - y - 1 = 0$  and  $2x - y + 5 = 0$ .
- Q12. A, B and C are collinear points and  $AB = BC$ . If A is the point  $(4, 5)$  and B is the point  $(1, -1)$ , find the coordinates of C.
- Q13. Find the equation of the line which passes through the point of intersection of  $5x - 3y + 2 = 0$  and  $x + 3y + 1 = 0$ , and is parallel to  $2x + 3y + 3 = 0$ .

## Level 1 — Coordinate geometry - ANSWERS

- Q1. A(6, 3) B(-3, 5) C(-7, 0) D(-3, -6) E(2, -2) F(0, 0) G(7, -6) H(5, 0) I(-5, -2) J(0, -3)
- Q2. (a) (4, 6) (b) (3, 3) (c)  $(3\frac{1}{2}, 2)$  (d) (2, -1) (e)  $(-\frac{1}{2}, 1)$  (f)  $(-1\frac{1}{2}, -5\frac{1}{2})$
- Q3. (a)  $2\sqrt{10}$  units (b)  $\sqrt{97}$  units (c)  $\sqrt{153}$  units (d)  $\sqrt{10}$  units (e)  $2\sqrt{61}$  units (f)  $\sqrt{73}$  units
- Q4. (a)  $\frac{1}{2}$  (b)  $-1\frac{2}{3}$  (c)  $\frac{1}{9}$  (d)  $-2\frac{1}{2}$  (e)  $-\frac{9}{7}$  (f)  $-\frac{4}{13}$
- Q5. (a)  (b)  (c) 
- (d)  (e)  (f) 

- Q6. (a)  $m = 5, b = -2$  (b)  $m = -2, b = 3$  (c)  $m = \frac{3}{2}, b = -4$  (d)  $m = -\frac{1}{2}, b = 1$   
 (e)  $m = -1, b = 0$  (f)  $m = -1, b = \frac{1}{2}$
- Q7. (a)  $m = 2, b = 3$  (b)  $m = -2, b = 3$  (c)  $m = -1, b = -\frac{2}{3}$  (d)  $m = -\frac{1}{5}, b = 0$   
 (e)  $m = \frac{2}{3}, b = \frac{1}{3}$  (f)  $m = \frac{1}{4}, b = -1$

- Q8. (a)  $y = 3x - 9$  (b)  $y = -2x + 11$  (c)  $y = 5x + 20$  (d)  $y = -\frac{1}{2}x + \frac{1}{2}$   
 (e)  $y = \frac{2}{3}x + 5\frac{2}{3}$

(NOTE: Answers may also be written in general form)

- Q9. (a)  $y = 2x - 3$  (b)  $y = -2x + 5$  (c)  $y = -4x + 8$  (d)  $y = 3x + 2$   
 (e)  $y = -\frac{3}{2}x + 4$  (f)  $y = \frac{1}{2}x - 2\frac{1}{2}$

(NOTE: Answers may also be written in general form)

Q10.  $2x - y + 1 = 0$  and  $4x - 2y + 3 = 0$

Q11.  $y = 4x - 3$  or  $4x - y - 3 = 0$

Q12.  $3y - x + 3 = 0$  and  $6y - 2x + 4 = 0$

Q13.  $y = -\frac{3}{2}x + 5$  or  $3x + 2y - 10 = 0$

Q14. (3, 15), (8, 35) and (4, 19)

Q15. Points lie on line  $x - 2y - 6 = 0$

## Level 2 — Coordinate geometry - ANSWERS

- Q1. (a)  $y = \frac{2}{3}x + 2$  (b)  $y = -\frac{1}{2}x - 1$  (c)  $y = 4x - 2$
- Q2.  $3x - 2y = 0$  Q3.  $m = -4, n = -3$
- Q4.  $\frac{\sqrt{117}}{2}$  units Q5.  $2x - 3y - 24 = 0$
- Q6.  $x - y + a = 0$  Q7.  $2x - 5y + 39 = 0$
- Q8.  $m_{CA} = \frac{1}{2}, m_{CB} = -2 \therefore$  perpendicular. Area = 30 units<sup>2</sup>  
 (NOTE: Can also use Pythagoras' Theorem)
- Q9.  $AB = CD = \sqrt{5}$  units;  $BC = AD = \sqrt{17}$  units;  $m_{AB} = m_{DC} = \frac{1}{2} \therefore AB \parallel DC$   
 $m_{BC} = m_{AD} = -\frac{1}{4} \therefore BC \parallel AD$
- Q10. All sides are  $5\sqrt{2}$  units;  $m_{AB} = m_{CD} = \frac{1}{7} \therefore AB \parallel CD$ ;  $m_{BC} = m_{AD} = 7 \therefore BC \parallel AD$
- Q11.  $y = 2x + 5$   
 Q12. (-2, -7)  
 Q13.  $12x + 18y + 5 = 0$