

Coordinate Geometry Worksheet 1

1. Find the gradient between the following points:

(a) $(3, 8)$ and $(5, 11)$.

(b) $(2, 5)$ and $(4, -1)$.

(c) $(\frac{1}{2}, 2)$ and $(\frac{5}{2}, 4)$.

(d) $(1, 7)$ and $(4, -3)$.

(e) $(9, a)$ and $(7, -3)$.

2. Find the value of the variable in the following:

(a) Gradient between $(3, 8)$ and $(a, 9)$ is 3.

(b) Gradient between $(2, b)$ and $(-7, 8)$ is $\frac{1}{2}$.

(c) Gradient between $(\frac{1}{2}, c + 1)$ and $(\frac{2}{3}, -1)$ is $\frac{2}{3}$.

3. Find the intersection of the following pairs of lines:

(a) $y = 3x - 2$ and $y = -2x - 1$.

(b) $2x + 5y = 10$ and $y = 2x + 8$.

(c) $4x - 3y = 0$ and $2x + y = 1$.

(d) $6x + 5y = 7$ and $4x - 3y = 1$.

4. Find the gradient of the line:

(a) $7x - 2y + 10 = 0$.

(b) $ax - by = 7$.

5. Find the gradient of the line perpendicular to:

(a) $y = \frac{1}{2}x + 3$.

(b) $2x + 5y = 0$.

(c) $px + qy = r$.

6. Find the equation (in the form $ax + by = c$) of the following lines:

(a) Gradient 2 through the point $(\frac{2}{3}, 5)$.

(b) Gradient $-\frac{2}{3}$ through the point $(3, 2)$.

(c) Through the points $(3, 2)$ and $(9, -1)$.

(d) Through the points $(\frac{1}{3}, -\frac{1}{2})$ and $(-\frac{1}{4}, \frac{2}{3})$.

(e) \star Through the points $(0, a)$ and $(b, 0)$.

7. Find the equation of the perpendicular bisector to the points $(1, 3)$ and $(2, -7)$ in the form $ax + by = c$.

8. Find the equation of the line parallel to $2x - 9y = 1$ through $(2, -3)$ in the form $ax + by = c$.

9. Find the equation of the line perpendicular to $7x - y = 1$ through $(8, 1)$ in the form $ax + by = c$. Also find where this line crosses the y -axis and the x -axis.

10. $A = (7, 4)$. $B = (2, 0)$. $C = (2, t)$. Given that $BC = AC$, find t .

11. Find the equation of the line perpendicular to $x + ay = 1$ through the point $(a, 0)$. Give your answer in the form $y = mx + c$ (where m and c are to be given in terms of a). \square
12. A triangle has vertices at $(1, 1)$, $(4, -2)$, and $(-2, -3)$. Find its area. \square $\frac{21}{2}$
13. $\star\star$ A triangle is bounded by the lines whose equations are $y = -x - 1$, $y = 2x - 1$ and $y = k$, where k is a positive integer.

For what values of k is the area of the triangle less than 2008? (You may need trial and improvement here. . .)