COORDINATE GEOMETRY PRACTICE

1. Given the equation of a straight line $2x + 4y = 24$, find

   (a) the gradient of the line [2]

   (b) the y-intercept of the line [1]

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2. If a point R $(m, -2m)$ lies on the line $3x - y = 5$, find the coordinates of R. [3]

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3. Given the points P $(2, 3)$, Q $(-1, -1)$ and R $(-6, -1)$

   (a) write down the coordinates of S such that PQRS forms a parallelogram [1]

   (b) find the distance between points P and Q [2]

ANSWER SCHEME

1. Given the equation of a straight line $2x + 4y = 24$, find

(a) the gradient of the line [2]

$2x + 4y = 24$

$4y = 24 - 2x$

$y = mx + c$, where m is the gradient and c is the y-intercept when $x = 0$.

$y = 6 - \frac{1}{2}x$

$m = -\frac{1}{2}$

(b) the y-intercept of the line [1]

sub $x = 0$ to $y = 6 - \frac{1}{2}x$

$y = 6$

2. If a point R $(m, -2m)$ lies on the line $3x - y = 5$, find the coordinates of R. [3]

R $(m, -2m)$

R (x, y)

$3x - y = 5 \rightarrow 3x - 5 = y$

Sub $x = m$, $y = -2m$ to $3x - 5 = y$

$-2m = 3m - 5$

$-5m = -5$

$m = 1$

Coordinates of R $(1, -2)$

3. Given the points P $(2, 3)$, Q $(-1, -1)$ and R $(-6, -1)$

(a) write down the coordinates of S such that PQRS forms a parallelogram

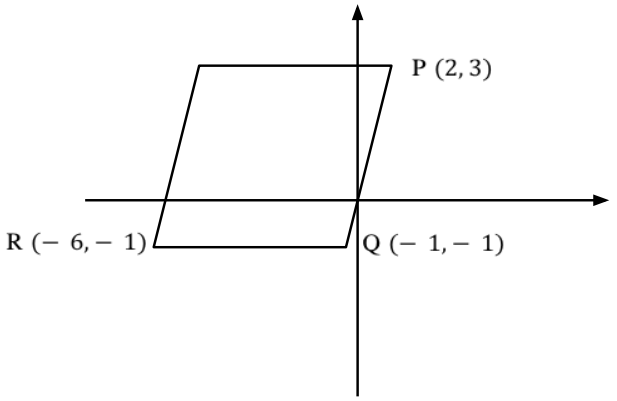
Distance of R from Q

$-6 + -1 = -5$

5 units

$2 - 5 = -3$

S $(-3, 3)$



(b) find the distance between points P and Q

P $(2, 3)$, Q $(-1, -1)$

Distance formula $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Distance $= \sqrt{(2 - (-1))^2 + (3 - (1))^2}$

Distance $= 5$ units