

FREE SAMPLE: THE FIRST QUESTION

Question 1 (30 marks)

- (a) The line p has a slope of -2 and crosses the y -axis at the point $(0, 6)$.

Find the equation of p .

[10 marks]

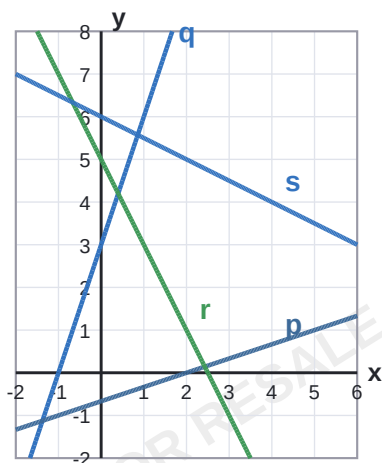
- (b) Find the area of the triangle formed by joining the following three points: $O(0, 0)$, $A(4, -6)$ and $B(6, 6)$.

[10 marks]

(c) The diagram shows four lines, labelled p, q, r and s. The slope of each of the four lines is given in the table. Identify each of the lines in the diagram by writing the appropriate label (p, q, r or s) beside its slope.

Slope	Label (p, q, r or s)
3	
$-\frac{1}{2}$	
$\frac{1}{3}$	
-2	

[10 marks]



Four lines p, q, r and s

THE WORKED ANSWER TO THAT QUESTION

Question 1 (30 marks) [The line]

(a) The line p has a slope of -2 and crosses the y -axis at the point $(0, 6)$. Find the equation of p .

(a) Answer: $y = -2x + 6$

- The equation of a line with slope m and y -intercept c is $y = mx + c$.
- Here $m = -2$ and the line crosses the y -axis at $(0, 6)$, so $c = 6$.
- The equation is $y = -2x + 6$.

KEY TAKEAWAY

Equation of a line: find the slope m (rise $\div$ run), then use $y = mx + c$ or $y - y_1 = m(x - x_1)$ with a known point.

(b) Find the area of the triangle formed by joining the following three points: $O(0, 0)$, $A(4, -6)$ and $B(6, 6)$.

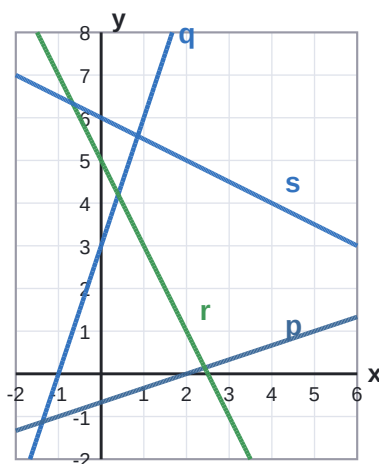
(b) Answer: 30 square units

- For a triangle with one vertex at the origin, $\text{Area} = \frac{1}{2}|x_1y_2 - x_2y_1|$.
- Take $A(4, -6)$ as (x_1, y_1) and $B(6, 6)$ as (x_2, y_2) : $x_1y_2 - x_2y_1 = (4)(6) - (6)(-6) = 24 - (-36) = 60$.
- $\text{Area} = \frac{1}{2} \times 60 = 30$ square units.

KEY TAKEAWAY

Area of a triangle from co-ordinates: $\frac{1}{2}|x_1y_2 - x_2y_1|$ when one vertex is the origin (take the positive value).

(c) The diagram shows four lines, labelled p , q , r and s . The slope of each of the four lines is given in the table. Identify each of the lines in the diagram by writing the appropriate label (p , q , r or s) beside its slope.



Four lines p , q , r and s

(c) Answer: slope 3 $\rightarrow$ q ; slope $-\frac{1}{2} \rightarrow$ s ; slope $\frac{1}{3} \rightarrow$ p ; slope $-2 \rightarrow$ r

- A line that rises from left to right has a positive slope; a line that falls has a negative slope. A steeper line has a slope of larger size.
- Check by reading two points on each line: slope = rise $\div$ run. line q: slope 3; line p: slope $\frac{1}{3}$; line r: slope -2 ; line s: slope $-\frac{1}{2}$.
- Matching: slope 3 $\rightarrow$ q; slope $-\frac{1}{2} \rightarrow$ s; slope $\frac{1}{3} \rightarrow$ p; slope $-2 \rightarrow$ r.

KEY TAKEAWAY

Slope from a graph: pick two points on the line and divide the rise by the run; rising lines are positive, falling lines negative, steeper lines have larger size.

LOS: *The line (Leaving Certificate Mathematics, Ordinary Level Paper 2, Strand 2 Geometry)*