

Starter

- Simplify the fraction: $\frac{320}{64} = \frac{80}{16} = \frac{20}{4} = 5$
- Change the subject of the formula to m: $p = 2(m + 4)$
 $p = 2m + 8$
 $p - 8 = 2m$
 $\frac{p-8}{2} = m$
 $\frac{p}{2} = m + 4$
 $m = \frac{p}{2} - 4$
- Simplify the expression $2(p + 4) \times p + 2 - p$
 $(2p + 8) \times p + 2 - p$
 $2p^2 + 8p + 2 - p$
 $2p^2 + 7p + 2$
- Solve the equation: $7(p - 1) - 3p = 2(3 - 2p) - p$
 $7p - 7 - 3p = 6 - 4p - p$
 $4p - 7 = 6 - 5p$
 $9p - 7 = 6$
 $9p = 13$
 $p = \frac{13}{9}$

Today's Learning:

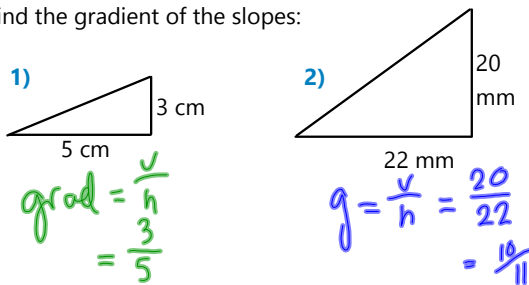
To calculate the gradient of a straight line using a formula.

Gradient

Gradient is a measure of how steep a line is.

$$\text{gradient} = \frac{\text{vertical distance}}{\text{horizontal distance}}$$

e.g. Find the gradient of the slopes:



Gradient of a Straight Line

Given coordinates of points on the line (x_1, y_1) and (x_2, y_2) , we can use

$$\text{gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

E.g. Find the gradient of the straight line that passes through

- $(4, 4)$ and $(6, 8)$.
 $\text{gradient} = \frac{8-4}{6-4} = \frac{4}{2} = 2$
- $(4, 7)$ and $(2, 10)$.
 $\text{grad} = \frac{10-7}{2-4} = \frac{3}{-2} = -\frac{3}{2}$

Positive gradients:



Negative gradients:



★ If points are **collinear**, they all lie on the same straight line (with the same gradient).

e.g. If $A(-4, -2)$, $B(-1, 1)$ and $C(8, k)$ are collinear, find the value of k.

$$AB \text{ grad} = \frac{1 - (-2)}{-1 - (-4)} = \frac{3}{3} = 1$$

$$BC \text{ grad} = \frac{k - 1}{8 - (-1)} = \frac{k - 1}{9}$$

collinear, so $1 = \frac{k - 1}{9}$
 $9 = k - 1$
 $10 = k$