Starter

Factorise fully $3x^2 - 48$. 2

$3\overline{)48}$

$3(x^2 - 16) = 3(x+4)(x-4)$

Express $x^2 + 8x - 7$ in the form $(x+a)^2 + b$. 2

$(x+4)^2 - 23$

$(x+4)(x+4)$
$= x^2 + 4x + 4x + 16$
$= x^2 + 8x + 16$

Multiply out the brackets and collect like terms:

$(2x-5)(3x+1)$. 2

$= 6x^2 + 2x - 15x - 5$
$= 6x^2 - 13x - 5$

Today's Learning:

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

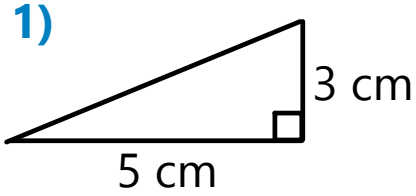
Gradient

Gradient is a measure of how steep a line is.

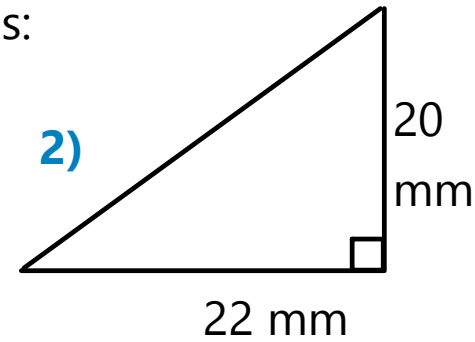
$$\text{gradient} = \frac{\text{vertical distance}}{\text{horizontal distance}}$$

e.g. Find the gradient of the slopes:

1)



2)



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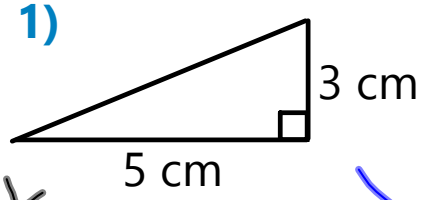
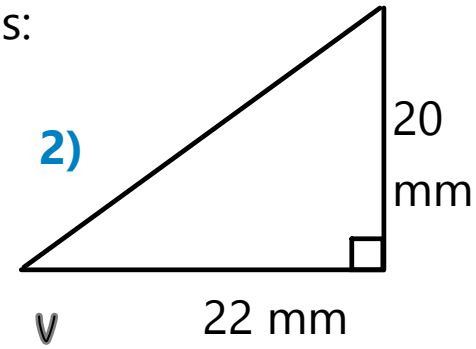


$g = \frac{v}{h} = \frac{3}{5}$

2)



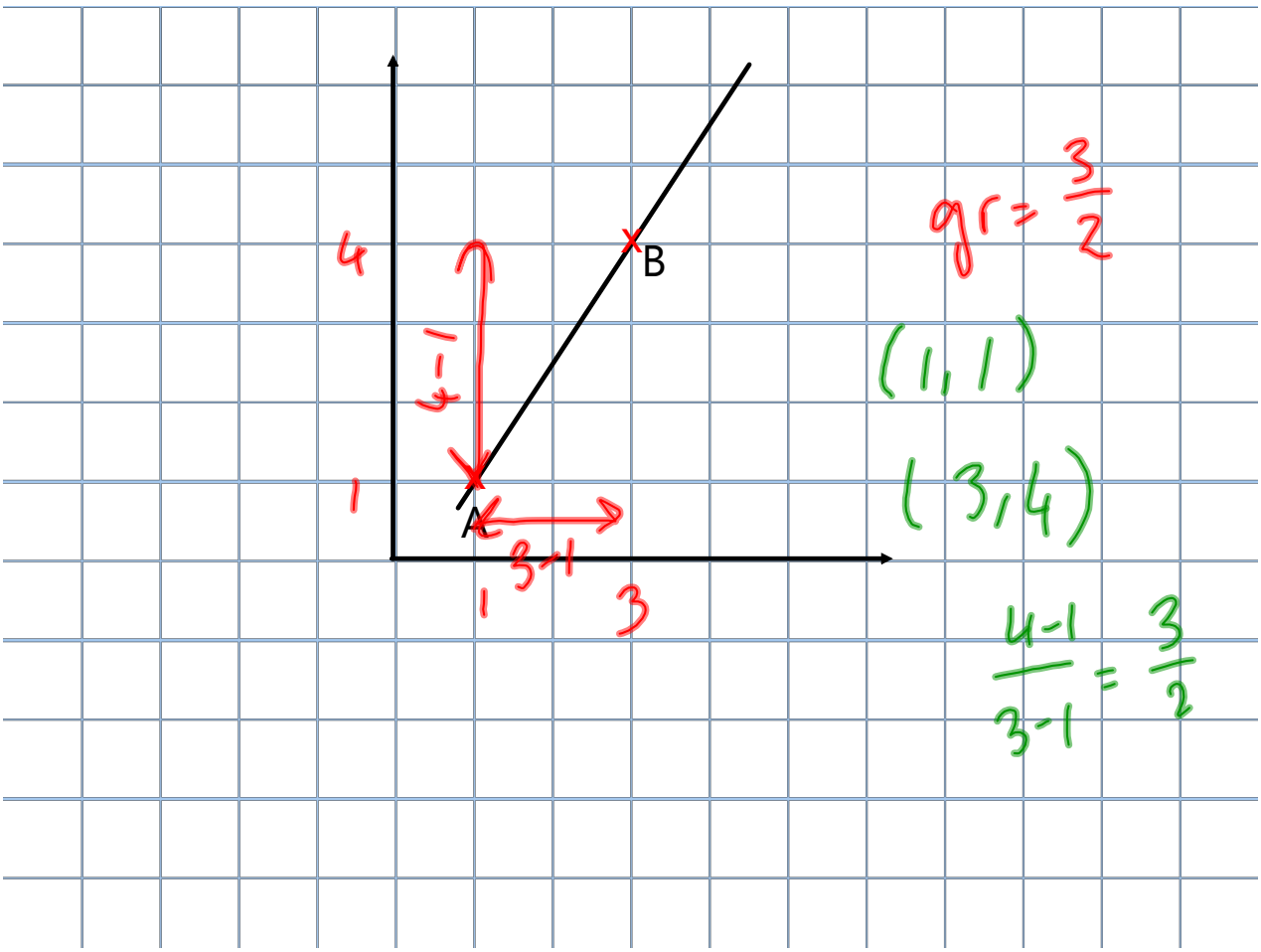
$g = \frac{v}{h} = \frac{20}{22} = \frac{10}{11}$

Try Q2 on page 22 and Q3 on page 23

-use the squares for distance-

$\frac{4}{1} = 4$

Answers pg 40



$gr = \frac{3}{2}$

$(1,1)$

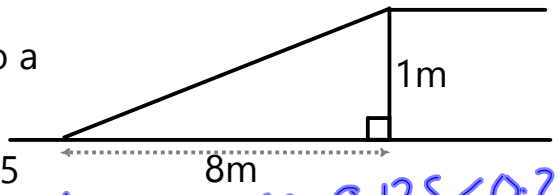
$(3,4)$

$\frac{4-1}{3-1} = \frac{3}{2}$

Starter

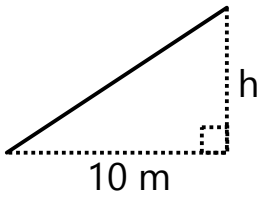
$\frac{1}{8} = 0.125$

1) This is the proposed ramp for the entrance to a school. It must have a gradient of less than 0.25 to be allowed. Will the ramp be allowed?



Yes because $0.125 < 0.25$.

2) The gradient of this slope is 0.8. How high is the slope?



8m

$g = \frac{v}{h}$

$0.8 = \frac{h}{10}$

$\times 10 \quad \times 10$

$8 = h$

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

1) (4, 4) and (6,8).

$x_1\ y_1 \quad x_2\ y_2$

$g = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-4}{6-4} = \frac{4}{2} = 2$

2) (4,7) and (2,10)

$x_1 y_1 \quad x_2 y_2$

$g = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10-7}{2-4} = \frac{3}{-2} = \frac{-3}{2}$

3) (4, -4) and (-2, 5)

$x_1\ y_1 \quad x_2\ y_2$

$g = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - -4}{-2-4} = \frac{9}{-6} = \frac{3}{-2}$

$= \frac{-3}{2}$

Work through Q5 on page 23.

5 a) $\frac{2}{10} = \frac{1}{5}$

b) $\frac{-4}{1} = -4$

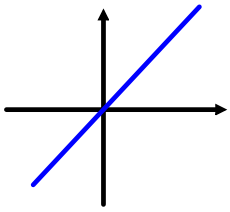
c) $\frac{-6}{3} = -2$

d) $\frac{5}{5} = 1$

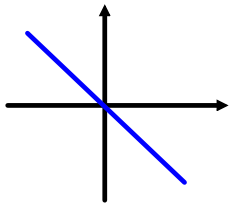
e) $\frac{-6}{8} = \frac{-3}{4}$

f) $\frac{5}{3}$

Positive gradients:



Negative gradients:



Parallel lines have the **same** gradient.