Lesson 4

Ratio : GCSE

Non - Calculator Throughout

4.1 Ratio Road Signs

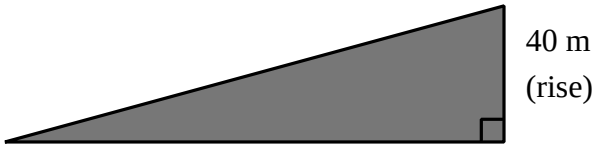
Example

The gradient ratio of a slope is a ratio of the form

$$rise \ : \ run$$

So, for example, if a car has travelled 200 m whilst gaining 40 m of height then the gradient ratio of the hill is

$$40 \ : \ 200$$



This cancels down to

$$1 \ : \ 5$$

which may then be what gets put on a road sign

Sometimes the gradient gets written like this;

$$Gradient \ = \ \frac{rise}{run}$$

which in this case is $\frac{1}{5}$

and sometimes this is converted to a percentage; in this example, that's 20%

4.2 Exercise

Question 1

Cancel down the following ratios as far as possible by removing common factors

(i) 3 : 15

(ii) 6 : 9

(iii) 15 : 55

(iv) 14 : 49

(v) 20 : 100

(vi) 6 : 10

(vii) 12 : 33

(viii) 25 : 15

(ix) 8 : 20

(x) 9 : 24

(xi) 180 : 120

(xii) 150 : 500

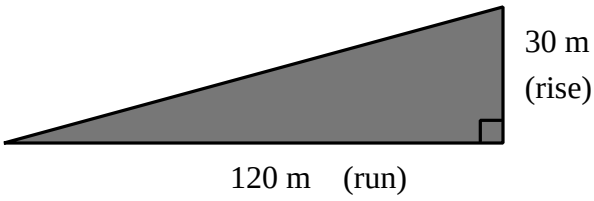
Question 2

For the following hills, write down the ratio of the slope in the form

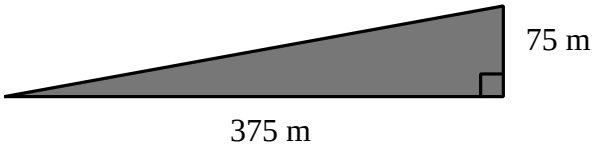
$$rise \ : \ run$$

and simplify the ratio by removing any common factors.

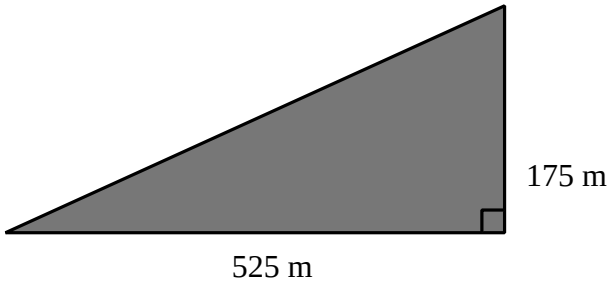
(i)



(ii)



(iii)



Question 3

Write the following ratios as percentages

(i) 1 : 2

(ii) 1 : 5

(iii) 2 : 5

(iv) 4 : 5

(v) 1 : 10

(vi) 3 : 10

(vii) 2 : 3

(viii) 3 : 4

(ix) 3 : 20

(x) 7 : 25

(xi) 19 : 20

(xii) 1 : 50

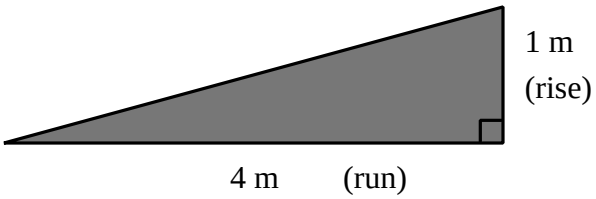
Question 4

For the following hills, write down the ratio of the slope in the form

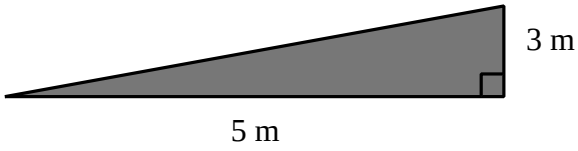
$$rise \ : \ run$$

and then write the ratio as a percentage.

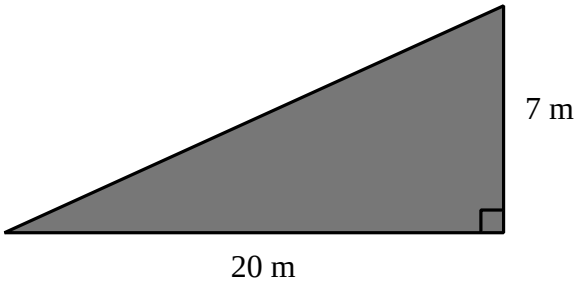
(i)



(ii)



(iii)



Question 5

Cancel down the following ratios as far as possible by removing common factors and then write the ratios as a percentage

(i) 30 : 40

(ii) 21 : 30

(iii) 3 : 60

(iv) 22 : 66

(v) 45 : 75

(vi) 4 : 50

(vii) 180 : 200

(viii) 28 : 21

(ix) 44 : 80

(x) 48 : 75

(xi) 270 : 90

(xii) 48 : 50

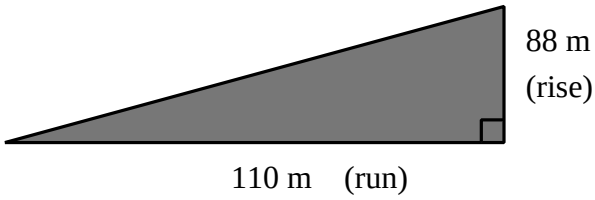
Question 6

For the following hills, write down the ratio of the slope in the form

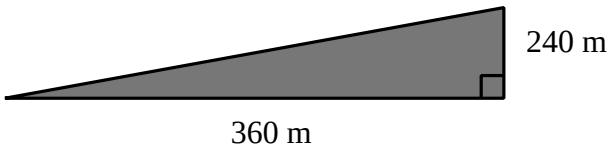
$$rise \ : \ run$$

and then simplify the ratio by removing any common factors before concluding by writing your simplified ratio as a percentage.

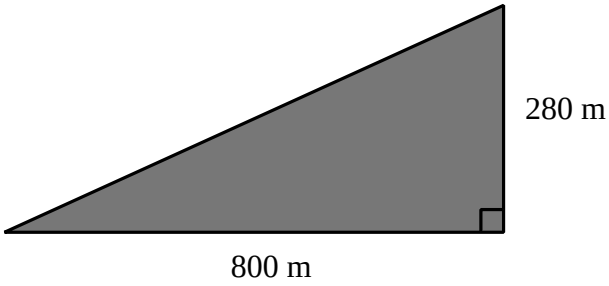
(i)



(ii)



(iii)



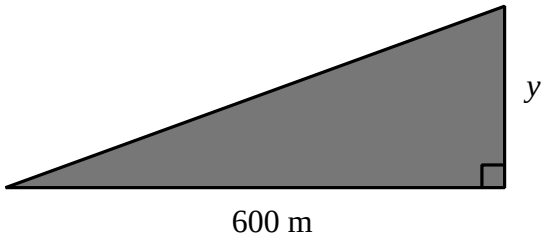
Question 7

For the following hills, the ratio of the slope in the form

$$rise \ : \ run$$

is

$$1 \ : \ 4$$



What is *y*, the height gained (the *rise*), over a horizontal distance of 600 m (the *run*) ?

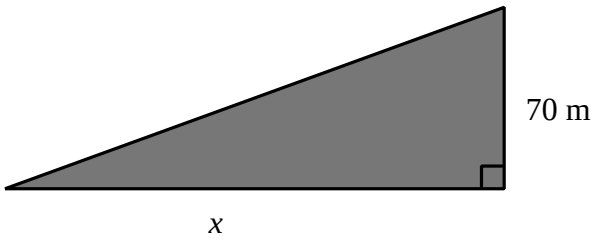
Question 8

For the following hills, the ratio of the slope in the form

$$rise \ : \ run$$

is

$$1 \ : \ 5$$



What is *x*, the horizontal distance (the *run*) when the height gained (the *rise*) is 70 m ?