

FRACTIONS:

1. Find the value of

$$(a) 3\frac{3}{4} \times 2\frac{2}{5} \div 1\frac{1}{2}$$

$$(b) \frac{5}{6} - \frac{1}{6}$$

$$(c) 2\frac{1}{2} + \frac{3}{4} \div \frac{1}{18}$$

Solution

$$1.(a) \quad 3\frac{3}{4} \times 2\frac{2}{5} \div 1\frac{1}{2}$$

$$= \frac{15}{4} \times \frac{12}{5} \div \frac{3}{2}$$

$$= \frac{15}{4} \times \frac{12}{5} \times \frac{2}{3}$$

$$= 6$$

$$(b). \quad \frac{5}{6} - \frac{1}{6}$$

$$= \frac{5-1}{6}$$

$$= \frac{4}{6}$$

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

$$(c) \quad 2\frac{1}{2} + \frac{3}{4} \div \frac{1}{18}$$

$$= \frac{5}{2} + \frac{3}{4} \times \frac{18}{1}$$

$$= \frac{5}{2} + \frac{9}{2}$$

$$= \frac{5+9}{2}$$

$$= \frac{8}{2}$$

$$= 4$$

2. Convert $1\frac{2}{5}$ as a decimal fraction.

Solution

$$1\frac{2}{5} = \frac{7}{5}$$

$$= 1.4$$

RATIO AND PROPORTION:

1. The ratio of boys to girls at Mimi Secondary school is 4:5. If there are 800 boys, find

(a) The number of girls in the school.

(b) The total number of pupils in the school.

Solution

(a) Let x be the number of girls in school

4 x girls

5 800 boys

$$5x = 4 \times 800$$

$$x = \frac{4 \times 800}{5}$$

$$x = 640$$

Therefore the number of girls is 640.

(b) Total number of pupils is $800 + 640$

$$= 1440$$

2. Bwalya is 1.8 m and Gondwe is 1.2 m tall. On a bright and sunny afternoon, they were standing next to each other facing the direction of the sun. If Gondwe's shadow was 6 m long, how long was Bwalya's shadow?

Solution

Let x be the shadow of Bwalya

Object image

1.8m x

1.2m 6m

$$x = \frac{6 \times 1.8}{1.2}$$

$$= \frac{6 \times 1.8 \times 10}{1.2 \times 10}$$

$$= \frac{6 \times 18}{12}$$

$$= 9$$

3. In an election, 80 000 people voted. The candidates A, B and C got were in the ratio 9:5:2 respectively. How many votes did candidate B received?

Solution

$$\text{Total} = 9 + 5 + 2$$

$$= 16$$

$$\text{Candidate B} = \frac{5}{16} \times 80\,000$$

$$= 25\,000 \text{ votes}$$

4. Express the ratio 1.5 km to 25 cm in its simplest form.

Solution

$$1.2 \text{ km} : 25 \text{ cm} \quad \text{we have to convert km to cm}$$

$$1.2 \times 1000 \times 100 : 25$$

$$120\,000 : 25$$

$$\mathbf{4800 : 1}$$

5. The scale of a map is 1 : 2500, calculate the length, in centimeters ,on the map that represents an actual distance of 1.2 km.

Solution

let x be actual distance

1 : 2500

x : 120000

$$x = \frac{120000}{2500}$$

$$x = 48 \text{ cm}$$

6. One painter would take 24 hours to paint a classroom. How long would 3 painters take to paint the classroom

Solution

let x be the number of hours

1 painter.....24hours

3 painters.....x

$$x = \frac{1 \times 24}{3}$$

$$x = 8$$

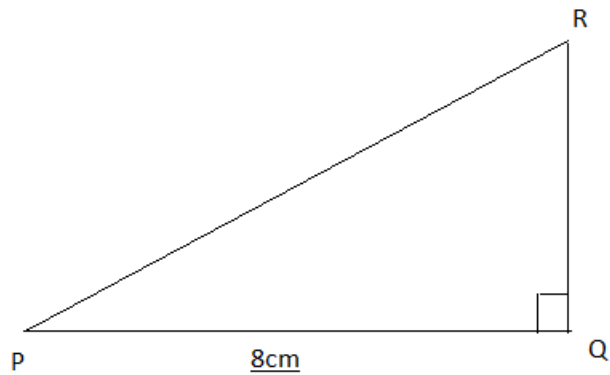
So 3 painters would take 8 hours to paint the classroom.

PYTHAGORUS THEOREM

1.The area of triangle PQR = 24 cm^2 . Given that PQ = 8 cm. Calculate

(a) RQ

(b) PR



Solution

$$1.(a) A = \frac{1}{2}bh$$

$$24 = \frac{1}{2} \times 8 \times h$$

$$24 = 4h$$

$$h = 6 \text{ cm}$$

$$(b) PR^2 = PQ^2 + QR^2$$

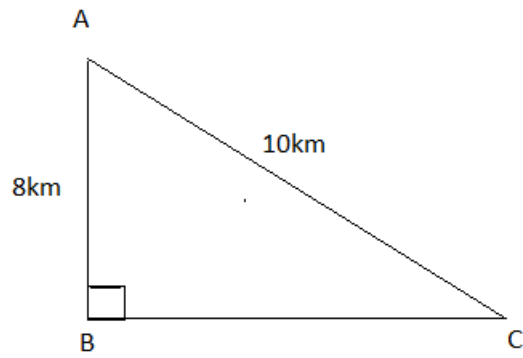
$$= 8^2 + 6^2$$

$$= 64 + 36$$

$$PR = \sqrt{100}$$

$$PR = 10 \text{ cm}$$

2.The diagram below shows two straight roads AB and BC which join the main road A and C. The road AB meets the road BC at right angles.



Given that $AB = 8$ km and $AC = 10$ km, find the length of the road BC.

Solution

$$BC^2 = AC^2 - AB^2$$

$$= 10^2 - 8^2$$

$$= 100 - 64$$

$$= 36$$

$$BC = \sqrt{36}$$

$$BC = \mathbf{6 \text{ km}}$$