6. tomatoes : onions $7 : 2$

21 kg tomatoes

how many kg of onions?

$7 : 2 = 21 : x$

$\frac{7}{2} = \frac{21}{x}$

$\frac{7x}{7} = \frac{42}{7}$

$x = 6$ kg

$\frac{21}{7}$ kg tomatoes

$\frac{21}{7} = 3$ kg in one part

$3 \cdot 2 = 6$ kg onions

7, 8, 9, 14

15. 6 : 11

larger portion is $875\ m^2$

$6 : 11 = x : 875$

$\frac{6}{11} = \frac{x}{875}$

$\frac{5250}{11} = \frac{11x}{11}$

$x = 477.2\ldots$

$x = 477\ m^2$

20. girls : boys 5 : 4

total students : 918

how students are girls?

total parts: 9

$\frac{918}{9} = 102$

girls: $5(102) = 510$

05. flour : sugar : cocoa

2 : 1.5 : 0.5

10 kg flour

a) sugar?

$2 : 1.5 = 10 : x$

$\frac{2}{1.5} = \frac{10}{x}$

$\frac{2x}{2} = \frac{15}{2}$

$x = 7.5\ kg$

b. cocoa?

$2 : 0.5 = 10 : x$

$\frac{2}{0.5} = \frac{10}{x}$

$2x = 5$

$x = 2.5\ kg$

Scale diagrams

$1 : 200 = 3.1 \text{ cm} : x$

diag : actual = obj.

$$\frac{1}{200} = \frac{3.1}{x}$$

$$x = (3.1)(200)$$

$$x = 620 \text{ cm}$$

2C: bigger numbers

2-3: smaller numbers

Scale map 1 : 250 000

map : reality.

a. $1 : 250000 = 11 : x$

b) $1 : 250000 = x : 11$

$$\frac{1}{250000} = \frac{11}{x}$$

$$x = (11)(250000)$$

$$x = 2\,750\,000 \text{ cm}$$

$$= 27.5 \text{ km}$$

$$2\,750\,000 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ km}}{1000 \text{ m}} = 27.5 \text{ km}$$

Chapter 1: Measurement

1.1 Imperial measures

Imperial: inches, feet, yards, etc.

SI or metric: cm, m, km, etc.

Referent: object used as an estimating tool

your thumb is a referent for 1 inch.
your foot " " " 1 foot.
your nose to fingertip " " 1 yard

1. Convert 7 yds to

a: feet $\quad 1\ \text{yd} = 3\ \text{ft}$

$$7\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}} = 7 \cdot 3\ \text{ft} = 21\ \text{ft}$$

b: inch: $\quad 1\ \text{yd} = 3\ \text{ft}$

$1\ \text{ft} = 12\ \text{in}$

$$7\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}} \times \frac{12\ \text{in}}{1\ \text{ft}} = 7 \cdot 3 \cdot 12\ \text{in}$$

$$= 252\ \text{in}$$

1 mile = 1760 yards

1 yd = 3 ft

2. Convert 3 miles to yards

a)

$$3 \text{ mi} \times \frac{1760 \text{ yd}}{1 \text{ mi}} = (3)(1760) \text{ yd}$$

$$= 5280 \text{ yd}$$

b) Convert 3 miles to inches.

miles → yards → feet → inches.

$$3 \text{ mi} \times \frac{1760 \text{ yd}}{1 \text{ mi}} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{12 \text{ in}}{1 \text{ ft}} = 3 \cdot 1760 \cdot 3 \cdot 12$$

$$= 190\,080 \text{ in}$$

1 ft = 12 in

10 inches → ? feet

$$10\ \text{in} \times \frac{1\ \text{ft}}{12\ \text{in}} = \frac{10}{12} \quad \text{ft} = 0.8\overline{3}\ \text{ft}$$

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