Section 1.1

September 12, 2012
10:42 AM

Math 10 N Douglas

Section 1.1
Imperial Measures of Length

Imperial Unit	Abbreviation	Referent	Relationship between units
Inch	in.	Thumb length	
Foot	ft.	Foot length	1ft = 12in
Yard	yd.	Arm Span	1yd = 3ft 1yd = 36 in.
Mile	mi.	Dist. walked in 20mins	1mi = 1760yd 1mi = 5280ft

NOTES: Imperial units are recorded using fractions NOT decimals.

Example 1: Find the length of each, using fractions.

a) Textbook $8\frac{14}{16}$ in $= 8\frac{7}{8}$ in

b) Pencil $5\frac{12}{16}$ in $= 5\frac{3}{4}$ in.

c) Eraser $2\frac{9}{16}$ in $= 2\frac{9}{16}$ in

Example 2:

1) Convert 5yd to:

a) feet

$\frac{1yd}{3ft} = \frac{5yd}{A}$

$A = 15ft$

b) inches

$\frac{1yd}{36in} = \frac{5yd}{B}$

$B = 180in$

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2.) Convert 51in. to:

a) feet and inches

$\frac{1ft}{12in} = \frac{A}{51in}$

$12A = 51ft$

$\frac{12A}{12} = \frac{51ft}{12}$

$A = \frac{51}{12}$

$A = 4\frac{3}{12}$

4ft 3in

b) yards, feet and inches

4ft 3in

ft ft ft ft in. in. in

1yd

So, 1yd, 1ft, 3in

PROPORTIONAL REASONING:

comparing units that are related by multiplication

$11 \times 12 = 132$

Example 3: The perimeter of a framed picture will be 136in.

a) What will be the perimeter of the framed picture in feet and inches.

$\frac{136in}{A} = \frac{12in}{1ft}$

$12A = 136ft$

$\frac{12A}{12} = \frac{136ft}{12}$

$A = \frac{136}{12}$

$A = 11\frac{4}{12}$

A = 11ft 4in

b) The framing material is sold by the foot. It costs $1.89/ft. What will the cost of materials be before taxes?

We need to buy 12ft and cut it.

COST $12\,ft \times \$1.89/ft$

$22.68

UNIT ANALYSIS:

a way to confirm the units in a conversion are correct.

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Show the relation between inches and feet:

$\frac{12\text{in}}{1\text{ft}}$ OR $\frac{1\text{ft}}{12\text{in}}$ these are the same.

Example 4: The school council has 6yd of fabric that will be cut into strips of 5in wide to make decorative banners for the school dance.

a) How many banners can be made?

$6\text{yd} \times \frac{3\text{ft}}{1\text{yd}} \times \frac{12\text{in}}{1\text{ft}} = 216\text{in}$

$\frac{216\text{in}}{5} = 43\frac{1}{5}$

43 banners

b) Use unit analysis to verify the conversions.

$6\text{yd} \times \frac{3\text{ft}}{1\text{yd}} \times \frac{12\text{in}}{1\text{ft}} = 216\text{ in}$

Example 5: A map of Alaska has a scale of 1 : 4 750 000. The distance on the map between Paxson and the Canadian border is $3\frac{11}{16}$ in. What is the distance to the nearest mile?

1in on the map = 4750000 inches in reality

1mi = 5280ft

$3\frac{11}{16}\text{ in} \rightarrow 3\frac{11}{16}(4750000) = 17515625\text{ in}$

MAP REALITY

$\frac{17\,515\,625\text{in}}{A} = \frac{12\text{in}}{1\text{ft}}$

12A = 17515625

HW: p. 11 – 12
4, 5, 7, 8, 11 – 16, 20

4, 5, 7, 8, 11