January 30, 2015

5th
6th

Starter

Simplify each complete

1. $2x - 7 + 5x$

$7x - 7$

2. $-n + 8 - n - 5$

$-2n + 3$

3. $4c - c + 12 - 9$

$3c + 3$

4. $-3v - 10 + 15 + 7v$

$4v + 5$

1/30 - Converting between Units

First you need to understand UNIT FRACTIONS.

Definition: a *unit fraction* is a fraction where the numerator and the denominator are the same size but may be different units.

Examples: $\frac{1\text{ ft}}{12\text{ in}}$ $\frac{1\text{ hr}}{60\text{ min}}$ $\frac{8\text{ pints}}{1\text{ gal}}$

Convert 13 feet to inches using unit fractions.

$$13\,feet = \frac{13\,ft}{1}$$

$$= \frac{13\,ft}{1} \cdot 1$$

$$= \frac{13\,ft}{1} \cdot (any\ unit\ fraction)$$

$$= \frac{13\,ft}{1} \cdot \frac{any\ number}{itself}$$

$$= \frac{13\,\cancel{ft}}{1} \cdot \frac{12\,in}{1\,\cancel{ft}}$$

$$= \frac{156\,in}{1}$$

$$= 156\,in$$

Convert one unit to the other by using unit fraction.

$2\frac{1}{2}$ ft = _____ in

$\frac{5 \text{ ft}}{2} \cdot \frac{12 \text{ in}}{1 \text{ ft}} = 30 \text{ in}$

12 in = 1 ft

$7\frac{3}{4}$ in = _____ ft

$\frac{31 \text{ in}}{4} \cdot \frac{1 \text{ ft}}{12 \text{ in}}$

$= \frac{31}{48}$ ft

$1\frac{1}{4}$ hours = 75 min

1 hr = 60 min

$\frac{5 \text{ hr}}{4} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$

$= 75 \text{ min}$

$1\frac{1}{2}$ pints = _____ quarts

2 pts = 1 qt

$\frac{3 \text{ pts}}{2} \cdot \frac{1 \text{ qt}}{2 \text{ pts}}$

$= \frac{3}{4}$ qts.

Convert 60 miles per hour to miles per minute using unit fractions.

1 hr = 60 min
Conversion

$$60\ mph = \frac{60\ miles}{1\ hour}$$

$$= \frac{60\ miles}{1\ hour} \cdot 1$$

$$= \frac{60\ miles}{1\ hour} \cdot (any\ unit\ fraction)$$

fps
wpm
rpm

$$= \frac{60\ miles}{1\ hour} \cdot \frac{any\ number\ itself}{}$$

$$= \frac{\cancel{60}\ miles}{1\ \cancel{hour}} \cdot \frac{1\ \cancel{hour}}{\cancel{60}\ min}$$

$$= \frac{1\ miles}{1\ min}$$

$$= 1\ mi/min$$

Convert each unit rate using unit fractions.

1 mi = 5280 ft

20 mph = _____ ft/hr

$$\frac{20\ \text{mi}}{\text{hr}} \cdot \frac{5280\ \text{ft}}{1\ \text{mi}} = 105{,}600\ \text{ft/hr}$$

20 mph = _____ miles/minute

miles/hour

$$\frac{20\ \text{mi}}{\text{hr}} \cdot \frac{1\ \text{hr}}{60\ \text{min}} = \frac{1}{3}\ \text{mi/min}$$

1 hour = 60 min

20 gal/min = _____ gal/hr

$$\frac{20\ \text{gal}}{\text{min}} \cdot \frac{60\ \text{min}}{1\ \text{hr}} = 1200\ \text{gal/hr}$$

60 min = 1 hr

15 miles/gal = _____ miles/quart

$$\frac{15\ \text{mi}}{\text{gal}} \cdot \frac{1\ \text{gal}}{4\ \text{qts}} = \frac{15}{4}\ \text{mi/qt} = 3\frac{3}{4}\ \text{mi/qt} = 3.75$$

1 gal = 4 qts

Homework

Green WS6

Due Tuesday