Measuring in Imperial Part II

Sometimes converting within the imperial system can get a bit more complicated. Because the imperial system uses fractions of an inch, you need to also be able to work with fractions.

Fraction Review

Adding and Subtracting

2 + 3 = 5 … what does this really mean?

So…. $\frac{1}{2}+\frac{1}{3}=\frac{2}{5}$?????

How does this work?

Change fractions to common denominators and add numerators.

$\frac{1}{2}\times\frac{3}{3} + \frac{1}{3}\times\frac{2}{2}$

$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

What about subtracting?

$\frac{9}{16} - \frac{1}{4}\times 4$

$\frac{9}{16} - \frac{4}{16}$

$\frac{5}{16}$

$3\frac{5}{8} - \frac{1}{4}\times 2$

$3\frac{5}{8} - \frac{2}{8}$

$3\frac{3}{8}$

$5\frac{1}{4}\times 2 \; 2\frac{3}{8}$

$5\frac{2}{8} - 2\frac{3}{8}$

$3\frac{-1}{8}$

$2\frac{8-1}{8}$

$2\frac{7}{8}$

Multiplying and Dividing

In trades, you will mostly use multiplying and dividing by whole numbers … Can you get 3 pieces that are $5\frac{3}{4}$" long out of a piece of pipe that is 18" long?

6"

$6\times 3 = 18$ ✓ yes

Adding Imperial Units:

When we add lengths that contain more than 1 unit we may need to convert the length into 1 unit.

How much pipe do I need to buy if I need a piece 2 feet long , a piece 5'4" long and 7'2" long?

It's really important to remember that there are 12 inches in a foot.

2 ft
5 ft 4 in
7 ft 2 in
---
14 ft 6 in

Convert the following

10 ft, 2 in to in

12 × 10 = 120
+ 2
---
122 in

7 yds, 5 ft to in

36 × 7 = 252 in
12 × 5 = 60 in
---
312 in

8 yds, 2 ft to ft

8 × 3 = 24 ft
2 ft
---
26 ft

Calculating in the Imperial System

When performing these operations, sometimes you can just add or subtract and sometimes you will need to convert to just one type of measurement before calculating

4 ft, 5 in + 7 ft, 3 in

4 ft 5 in
7 ft 3 in
---
11 ft 8 in

12 ft, 8 in + 10 ft, 7 in

12 ft 8 in
10 ft 7 in
---
22 ft 15 in
23 ft 3 in

6 ft, 4 in – 3 ft, 11 in

6 ft 4 in
- 3 ft 11 in
---
3 ft - 7 in
2 ft 5 in

9 ft – 10 in

9 ft
- 10 in
---
9 ft - 10 in
8 ft 2 in

What about …

6ft 2in + 7 ft 8 in

$$\begin{array}{r} 6\text{ft } 2\text{in} \\ +\ 7\text{ft } 8\text{in} \\ \hline 13\text{ft } 10\text{ in} \end{array}$$

5 ft 4 in + 6 ft 10 in

$$\begin{array}{r} 5\text{ft } 4\text{in} \\ +\ 6\text{ft } 10\text{ in} \\ \hline 11\text{ft } 14\text{in} \end{array} \qquad 12\text{ft } 2\text{in}$$

10 ft 6 in – 4 ft 2 in

$$\begin{array}{r} 10\text{ft } 6\text{in} \\ -\ 4\text{ft } 2\text{in} \\ \hline 6\text{ft } 4\text{ in} \end{array}$$

$8\frac{1}{4}" + 10\frac{7}{8}"$

$8\frac{2}{8} + 10\frac{7}{8}$

$18\frac{9}{8} \qquad 19\frac{1}{8}$ in

$5\frac{3}{4}" - 2\frac{1}{2}"$

$5\frac{3}{4} - 2\frac{2}{4}$

$3\frac{1}{4}$ in

5 ft – 2 ft 1 in

$$\begin{array}{r} 5\text{ft} \\ -\ 2\text{ft } 1\text{in} \\ \hline 3\text{ft } -1\text{in} \end{array} \qquad 2\text{ft } 11\text{in}$$

20 ft – 5 ft 8 in

$$\begin{array}{r} 20\text{ft} \\ -\ 5\text{ft } 8\text{in} \\ \hline 15\text{ft } -8\text{in} \end{array}$$

$$\boxed{14\text{ft } 4\text{in}}$$

$3' \ 8\frac{1}{4}" \ \frac{2}{8}$

$+5'10\frac{7}{8}"$

$8'18\frac{9}{8}"$

$9'6\frac{9}{8}"$

$9'7\frac{1}{8}"$

$8' \ 2\frac{1}{2}" \ \frac{2}{4}$

$-2' \ 5\frac{3}{4}"$

$6' \ -3\frac{-1}{4}$

$5' \ 9\frac{-1}{4}$

$5' \ 8\frac{3}{4}"$

Math at Work

Mary is a finishing carpenter who is replacing the case moulding around a double French door and the baseboards around the 4 walls of a living room. The dimensions of the rectangular living room are 20' x 15'. The French door is along one of the 20' walls, and the door frame measures 72" wide and 84" high. Case moulding costs $9.50 a linear foot and baseboard costs $4.50 a linear foot. These items must be purchased in whole feet. If Mary's labour charge is $18.50 a linear foot, what will be the total cost of this job?