Unit 40   Word Problems Using Fractions

1. An $8\frac{3}{4}$ foot board must be shortened to $6\frac{1}{3}$ feet. How much must be removed?

Unknown: length to be removed

Given:
current length = $8\frac{3}{4}$ feet

new length = $6\frac{1}{3}$ feet

This answer makes sense because

$$2\frac{5}{12} + 6\frac{4}{12} = 8\frac{9}{12} = 8\frac{3}{4}$$

Solution:
removed = current length - new length
$$= 8\frac{3}{4} \text{ feet} - 6\frac{1}{3} \text{ feet}$$

LCD is 4 x 3 = 12
$$8\frac{3}{4} = 8 + \frac{3 \times 3}{4 \times 3} = 8 + \frac{9}{12} = \quad 8\frac{9}{12}$$

$$-6\frac{1}{3} = 6 + \frac{1 \times 4}{3 \times 4} = 6 + \frac{4}{12} = -6\frac{4}{12}$$

$$\boxed{2\frac{5}{12} \text{ feet}}$$

2. Hamburger costs $2.48 per pound. How much will it cost to make 25 quarter-pound hamburgers?

Unknown:
pounds required
cost of required hamburger

Given:
hamburger costs = $2.48 per pound
hamburgers per pound = 4
hamburgers needed = 25

This answer makes sense because
($2.50 per pound)(6 pounds) = $15.00

Solution:

$$\text{pounds required} = \frac{\text{hamburgers needed}}{\text{hamburgers per pound}}$$

$$= \frac{25 \text{ hamburgers}}{4 \text{ hamburgers per pound}} = 6\frac{1}{4} \text{ pounds}$$
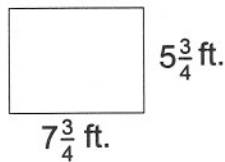
cost = (pounds required)(cost per pound)
$$= (6\frac{1}{4} \text{ lbs.})(\$2.48 \text{ per pound})$$

$$= (\frac{25}{4})(\frac{\$2.48}{1}) = \frac{\$62.00}{4} = \boxed{\$15.50}$$

3. Ted wants to frame a window which is $7\frac{3}{4}$ feet long and $5\frac{3}{4}$ feet wide. How many $6\frac{1}{2}$ foot boards will he need?

Unknown: boards required

Given: boards are $6\frac{1}{2}$ ft.

[rectangle diagram]
$5\frac{3}{4}$ ft.
$7\frac{3}{4}$ ft.

This answer makes sense because 4 boards are 4 x 6.5 = 26', and 26 feet is 1 foot short of the required 27 feet.

Solution:

$$\text{number of boards} = \frac{\text{perimeter}}{\text{board length}} = \frac{p}{6\frac{1}{2}}$$

$$P = l + w + l + w$$

$$P = 7\frac{3}{4} + 5\frac{3}{4} + 7\frac{3}{4} + 5\frac{3}{4} = 24\frac{12}{4} = 27 \text{ ft.}$$

$$\text{boards} = \frac{P}{6\frac{1}{2}} = \frac{27}{6\frac{1}{2}} = \frac{27}{\frac{13}{2}} = (\frac{27}{1})(\frac{2}{13}) = \frac{54}{13} = 4\frac{2}{13} \text{ ft.}$$

$$\boxed{5 \text{ boards}}$$