

## Welding: Hibachi Grill Project

### Handle Construction/Division of Fractions

#### Operations with Fractions:

- Reducing: fractions are always written in their most reduced form. All common factors between numerator and denominator are cancelled.

$$\frac{5}{10} = \frac{1}{2} \text{ or } \frac{27}{15} = \frac{9 \cdot \cancel{3}}{5 \cdot \cancel{3}} = \frac{9}{5}$$

- Multiplying: multiply across the numerators (top) and then across the denominators (bottom), then simplify/reduce the resulting fraction. OR Reduce common factors before the multiplication.

$$\frac{2}{3} \cdot \frac{5}{7} = \frac{2 \cdot 5}{3 \cdot 7} = \frac{10}{21}$$

$$\frac{4}{15} \cdot \frac{25}{44} = \frac{\cancel{4} \cdot 1}{\cancel{5} \cdot 3} \cdot \frac{\cancel{5} \cdot 5}{\cancel{4} \cdot 11} = \frac{1 \cdot 5}{3 \cdot 11} = \frac{5}{33}$$

- Dividing: to divide two fractions, multiply by the reciprocal (flip) of the second fraction. Then follow the steps of multiplication above.

$$\frac{3}{8} \div \frac{9}{20} = \frac{3}{8} \cdot \frac{20}{9} = \frac{3 \cdot 20}{8 \cdot 9} = \frac{60}{72} = \frac{5}{6}$$

*or reduce 1<sup>st</sup>*

$$\frac{3}{8} \div \frac{9}{20} = \frac{3}{8} \cdot \frac{20}{9} = \frac{1}{2} \cdot \frac{5}{3} = \frac{5}{6}$$

With whole numbers:

$$\begin{aligned} \frac{10}{3} \div 2 &= \frac{10}{3} \div \frac{2}{1} = \frac{10}{3} \cdot \frac{1}{2} \\ &= \frac{5}{3} \cdot \frac{1}{1} = \frac{5}{3} \end{aligned}$$

## Application:

How many 8 inch lengths can you cut from a rod that is 5 feet long if there is no material loss from the cuts?

First we need to convert into the same units of measure (use 12 inches = 1 foot)

$$5ft = \frac{5ft}{1} \cdot \frac{12in}{1ft} = 60in$$

Next determine how many 8 inch lengths we can cut by using division:

$$60in \div 8in = \frac{60in}{8in} = \frac{\cancel{4} \cdot 15}{\cancel{4} \cdot 2} = \frac{15}{2} = 7\frac{1}{2}$$

Only 7 full 8 inch lengths can be cut from 5 feet of rod.

Perform the following multiplication and division. Always express fractions in reduced form.

1. $\frac{32}{5} \cdot \frac{1}{4} =$	2. $\frac{5}{4} \div \frac{3}{8} =$
3. $10 \cdot \frac{4}{5} =$	4. $80 \div \frac{2}{3} =$
5. $\frac{5}{8} \div 4 =$	6. $\frac{27}{4} \cdot \frac{2}{3} =$

