

5.4 Solving Proportions

① Solving proportions using multiplication:

$$\textcircled{1} \quad \frac{5}{7} = \frac{x}{21} \rightarrow \frac{\overset{3}{\cancel{21}} \cdot 5}{1 \cdot \cancel{7}} = \frac{x \cdot \cancel{21}}{\cancel{21} \cdot 1} \rightarrow 3 \cdot 5 = x$$

$$15 = x$$

$$\textcircled{2} \quad \frac{w}{6} = \frac{6}{9} \rightarrow \frac{\overset{3}{\cancel{18}} \cdot w}{\cancel{6}} = \frac{6 \cdot \cancel{18}^2}{\cancel{9}} \rightarrow 3 \cdot w = 6 \cdot 2$$

$$3w = 12$$

$$w = 4$$

$$\textcircled{3} \quad \frac{y}{6} = \frac{2}{4} \rightarrow \frac{\overset{2}{\cancel{12}} \cdot y}{\cancel{6}} = \frac{2 \cdot \overset{3}{\cancel{12}}}{\cancel{4}} \rightarrow 2y = 2 \cdot 3$$

$$2y = 6$$

$$y = 3$$

② Solving Proportions using cross products

$$\text{a) } \frac{x}{8} = \frac{7}{10} \rightarrow \frac{\cancel{x}}{\cancel{8}} = \frac{\cancel{7}}{\cancel{10}} \quad 8 \cdot 7 = 10 \cdot x$$

$$\frac{56}{10} = \frac{\cancel{10} \cdot x}{\cancel{10}} \quad x = 5.6$$

$$\text{b) } \frac{\cancel{9}}{\cancel{y}} = \frac{\cancel{3}}{\cancel{17}} \quad \frac{\cancel{8y}}{\cancel{3}} = \frac{153}{3} \quad y = 51$$

$$\text{i) } \frac{\cancel{2}}{\cancel{7}} = \frac{\cancel{x}}{\cancel{28}} \quad \frac{56}{7} = \frac{7x}{7} \quad x = 8$$

$$\text{2) } \frac{\cancel{2}}{\cancel{5}} = \frac{\cancel{6}}{\cancel{y}} \quad \frac{30}{2} = \frac{2y}{2} \quad y = 15$$

$$\text{3) } \frac{\cancel{40}}{\cancel{z+1}} = \frac{\cancel{15}}{\cancel{6}} \quad 240 = 15(z+1)$$

$$240 = 15z + 15$$

$$\begin{array}{r} 240 \\ -15 \\ \hline 225 = 15z \end{array} \quad \begin{array}{r} 240 \\ -15 \\ \hline 225 = 15z \end{array} = z = 15$$

$$\text{4) } \frac{5}{2} = \frac{d-2}{4}$$