

Math 105 Skill Builder # F - 6
Multiplying Three or More Fractions and Whole Numbers

Don't forget that a whole number can be written as a fraction by writing the whole number over 1. For example,

$$5 = \frac{5}{1} \text{ and } 22 = \frac{22}{1}$$

Step 1 Cancel the common factors, between the numerators and the denominator.

Step 2 Multiply the numerators together for the numerator of the product, and multiply the denominator together for the denominator for the product.

$$\begin{aligned} \frac{1}{2} \cdot \frac{5}{12} \cdot \frac{5}{14} \cdot 3 &= \frac{1}{2} \cdot \frac{5}{12} \cdot \frac{5}{14} \cdot \frac{3}{1} && \text{Write 3 as a fraction.} \\ &= \frac{1 \cdot 5 \cdot 5 \cdot 1}{2 \cdot 4 \cdot 14 \cdot 1} && \text{Divide 3 and 12 by 3.} \\ &= \frac{5 \cdot 5}{4 \cdot 14} && \text{Multiply numerators for numerator and} \\ & && \text{denominators for denominator.} \\ &= \frac{25}{64} && \text{Stop, since the numerator and the denominator} \\ & && \text{have no factor in common other than 1.} \end{aligned}$$

Examples:

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$\frac{7}{8} \cdot \frac{1}{3} \cdot \frac{7}{30} \cdot 5 = \frac{7 \cdot 1 \cdot 7 \cdot 5}{8 \cdot 3 \cdot 30 \cdot 1} = \frac{7 \cdot 7}{8 \cdot 3 \cdot 6} = \frac{49}{144}$	
$\frac{5}{20} \cdot \frac{3}{12} \cdot \frac{1}{9} \cdot 4 \cdot 3 = \frac{5 \cdot 3 \cdot 1 \cdot 4 \cdot 3}{20 \cdot 12 \cdot 9 \cdot 1} = \frac{1}{9}$	
$\frac{9}{36} \cdot \frac{2}{10} \cdot \frac{1}{4} \cdot 5 \cdot 2 = \frac{9 \cdot 2 \cdot 1 \cdot 5 \cdot 2}{36 \cdot 10 \cdot 4 \cdot 1} = \frac{9}{72}$	

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Perform the indicated operation:

$$1) \frac{13}{6} \cdot \frac{3}{36} \cdot \frac{3}{12} \cdot 3 =$$

$$2) \frac{2}{49} \cdot \frac{5}{24} \cdot \frac{1}{15} \cdot 2 \cdot 7 =$$

$$3) \frac{3}{64} \cdot \frac{7}{18} \cdot \frac{4}{11} \cdot 8 =$$

$$4) \frac{2}{27} \cdot \frac{35}{5} \cdot \frac{15}{28} \cdot 9 \cdot 4 =$$

$$5) \frac{6}{13} \cdot \frac{39}{32} \cdot \frac{3}{20} \cdot 4 =$$

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Answers:

1) $\frac{13}{96}$

2) $\frac{1}{210}$

3) $\frac{7}{132}$

4) 10

5) $\frac{3}{80}$

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