

Pre-algebra
Skill-BUILDER # F – 2
Multiplying Signed Fractions

To multiply two signed fractions, simply **multiply across**, i.e. multiply the numerators and multiply the denominators. The same multiplication rules for signed numbers apply. Sometimes it is better to cancel common factors first before carrying out the multiplication. Thus, for nonzero integers b and d , we have

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$$

Examples Find the product.

1) $\frac{4}{7} \cdot \frac{3}{5}$

Solution:

$$\frac{4}{7} \cdot \frac{3}{5} = \frac{4 \cdot 3}{7 \cdot 5} = \frac{12}{35}$$

2) $-\frac{4}{9} \cdot \frac{15}{8}$

Solution:

$$-\frac{4}{9} \cdot \frac{15}{8} = -\frac{4 \cdot 15}{9 \cdot 8} \quad (-) \cdot (+) = (-)$$

$$= -\frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot 5}{3 \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{2} \cdot 2} \quad \text{factor each integer}$$

$$= -\frac{5}{6} \quad \text{cancel common factors}$$

3) $\frac{12}{16} \left(-\frac{20}{9}\right) \left(-\frac{18}{15}\right)$

Solution:

$$\frac{12}{16} \left(-\frac{20}{9}\right) \left(-\frac{18}{15}\right)$$

$$= \frac{12 \cdot 20 \cdot 18}{16 \cdot 9 \cdot 15} \quad (-)(-) = (+)$$

$$= \frac{\cancel{4} \cdot \cancel{3} \cdot \cancel{4} \cdot \cancel{5} \cdot 2 \cdot \cancel{3} \cdot \cancel{3}}{\cancel{4} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{5}} \quad \text{Factor each integer (more than one way of doing this).}$$

$$= 2 \quad \text{Cancel common factors.}$$

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Find the product.

1) $\frac{8}{9} \cdot \frac{10}{7}$

2) $-\frac{9}{10} \cdot \frac{5}{6}$

3) $-\frac{6}{15} \cdot \left(-\frac{10}{4}\right)$

4) $\frac{12}{9} \cdot \left(-\frac{18}{20}\right)$

5) $\left(-\frac{2}{3}\right)\left(-\frac{1}{2}\right)\left(-\frac{6}{5}\right)$

6) $-\left(-\frac{4}{15}\right)\left(-\frac{5}{12}\right)\left(-\frac{9}{2}\right)$

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Answer Key:

1) $\frac{80}{63}$

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

3) 1

4) $-\frac{6}{5}$

5) $-\frac{2}{5}$

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