Pre-algebra
Skill-Builder # F – 1
Simplifying Signed Fractions

To simplify a fraction or to reduce it to lowest terms, factor the numerator and denominator, if possible, and cancel common factors.   Any factorization can be used but it is sometimes better to use prime factorization. We have for nonzero b and c:

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

<u>Examples</u> Simplify.

1) $\dfrac{24}{40}$

Solution:

$$\frac{24}{40} = \frac{\cancel{4} \cdot 6}{\cancel{4} \cdot 10} = \frac{\cancel{2} \cdot 3}{\cancel{2} \cdot 5} = \frac{3}{5}$$

OR

$$\frac{24}{40} = \frac{3 \cdot \cancel{8}}{5 \cdot \cancel{8}} = \frac{3}{5}$$

OR

$$\frac{24}{40} = \frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 3}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 5} = \frac{3}{5}$$

No matter how one does the factorization there is only one simplified form for the fraction.

2) $-\dfrac{60}{42}$

Solution:

$$-\frac{60}{42} = -\frac{\cancel{6} \cdot 10}{\cancel{6} \cdot 7} = -\frac{10}{7}$$

OR

$$-\frac{60}{42} = -\frac{\cancel{2} \cdot 30}{\cancel{2} \cdot 21} = -\frac{\cancel{3} \cdot 10}{\cancel{3} \cdot 7} = -\frac{10}{7}$$

OR

$$-\frac{60}{42} = -\frac{\cancel{2} \cdot 2 \cdot \cancel{3} \cdot 5}{\cancel{2} \cdot \cancel{3} \cdot 7} = -\frac{10}{7}$$

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Simplify the following fractions.

1) $\dfrac{16}{28}$

2) $\dfrac{45}{63}$

3) $-\dfrac{72}{40}$

4) $-\dfrac{64}{36}$

5) $\dfrac{56}{-80}$

6) $\dfrac{-90}{72}$

7) $\dfrac{-88}{-48}$

8) $\dfrac{-36}{-84}$

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Answer Key:

1) $\dfrac{4}{7}$

2) $\dfrac{5}{7}$

3) $-\dfrac{9}{5}$

4) $-\dfrac{16}{9}$

5) $-\dfrac{7}{10}$

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

7) $\dfrac{11}{6}$

8) $\dfrac{3}{7}$