

2.2

Reducing a Fraction to Lowest Terms

• Example 1

(a) Simplify $\frac{24}{42}$.

The GCF of 24 and 42 is 6.

Divide both the numerator and the denominator by their greatest common factor (GCF).

$$\frac{24}{42} = \frac{\cancel{6} \times 4}{\cancel{6} \times 7} = \frac{4}{7}$$

(b) Simplify $\frac{120}{180}$.

The GCF of 120 and 180 is 60.

$$\frac{120}{180} = \frac{\cancel{60} \times 2}{\cancel{60} \times 3} = \frac{2}{3}$$

● ● ● CHECK YOURSELF 1

Write each of the following fractions in simplest form.

a. $\frac{60}{75}$

b. $\frac{210}{252}$

• Example 2

$$(a) \frac{24}{42} = \frac{\overset{12}{\cancel{24}}}{\underset{21}{\cancel{42}}} = \frac{\overset{4}{\cancel{12}}}{\underset{7}{\cancel{21}}} = \frac{4}{7}$$

Divide by the common factor of 2.
Divide by the common factor of 3.

The original numerator and denominator are divisible by 2, and so we divide each by that factor to arrive at $\frac{12}{21}$.

Divide again for the result $\frac{4}{7}$, which is in lowest terms.

Note: If we had seen the GCF of 6 at first, we could have divided by 6 and arrived at the same result in one step, as in Example 1.

$$(b) \frac{120}{180} = \frac{\overset{2}{\cancel{120}}}{\underset{30}{\cancel{180}}} = \frac{2}{3}$$

Our first step is to divide by the common factor of 6. We then have $\frac{20}{30}$. There is still a common factor of 10, so we again divide.

● ● ● CHECK YOURSELF 2

Using the method of Example 2, write each of the fractions in simplest form.

a. $\frac{60}{75}$

b. $\frac{84}{196}$

● ● ● CHECK YOURSELF ANSWERS

1. (a) $\frac{60}{75} = \frac{\cancel{15} \times 4}{\cancel{15} \times 5} = \frac{4}{5}$; (b) $\frac{210}{252} = \frac{\cancel{42} \times 5}{\cancel{42} \times 6} = \frac{5}{6}$.

2. (a) Divide by the common factors of 3 and 5. $\frac{60}{75} = \frac{20}{25} = \frac{4}{5}$.

(b) Divide by the common factors of 4 and 7. $\frac{84}{196} = \frac{21}{49} = \frac{3}{7}$.

2.2 Exercises

Name _____

Section _____

Date _____

Write each fraction in simplest form.

1. $\frac{8}{12}$

2. $\frac{12}{15}$

3. $\frac{10}{14}$

4. $\frac{15}{50}$

5. $\frac{12}{18}$

6. $\frac{28}{35}$

7. $\frac{35}{40}$

8. $\frac{21}{24}$

9. $\frac{11}{44}$

10. $\frac{10}{25}$

11. $\frac{12}{36}$

12. $\frac{18}{48}$

13. $\frac{24}{27}$

14. $\frac{30}{50}$

15. $\frac{32}{40}$

16. $\frac{17}{51}$

17. $\frac{75}{105}$

18. $\frac{62}{93}$

19. $\frac{48}{60}$

20. $\frac{48}{66}$

21. $\frac{105}{135}$

22. $\frac{54}{126}$

A N S W E R S

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