

## Rational Functions Review 3

Date \_\_\_\_\_ Period \_\_\_\_\_

**Simplify each expression.**

1) 
$$\frac{9a + 3}{7a^2 - 7a} \cdot \frac{2a^2}{6a^3 + 2a^2}$$

2) 
$$\frac{n^2 - 16}{n - 4} \cdot \frac{7n^3 + 35n^2}{n^2 + 6n + 8}$$

3) 
$$\frac{k^2 - 5k - 14}{4k^2 + 8k} \cdot \frac{5k^2 + 10k}{k^2 - 5k - 14}$$

4) 
$$\frac{x^2 - 3x - 28}{x^2 - 6x - 40} \cdot \frac{x^2 - 4x - 60}{x^2 + 10x + 24}$$

5) 
$$\frac{63b - 90}{18b - 63} \div \frac{28b - 40}{18b - 63}$$

6) 
$$\frac{x^2 - x - 30}{x + 5} \div \frac{x^2 - 3x - 18}{4x^3 - 16x^2}$$

7) 
$$\frac{70k + 90}{35k + 45} \div \frac{30k - 20}{24k^2 - 16k}$$

8) 
$$\frac{9}{n^2 - 10n + 16} \div \frac{9n - 90}{2n - 16}$$

$$9) \frac{4k}{2k^2} + \frac{2k}{k^2 - 6k + 8}$$

$$10) \frac{2k}{3k} - \frac{k+6}{k^2 - 4}$$

$$11) \frac{6n}{n+3} + \frac{6}{5n-20}$$

$$12) \frac{6r}{r+4} - \frac{6}{5r-5}$$

$$13) \frac{x+2}{x^2+5x+6} + \frac{2x}{5}$$

$$14) \frac{4}{x+2} + \frac{2x}{x+6}$$

$$15) \frac{\frac{9}{u} + \frac{u-3}{u}}{u-3}$$

$$16) \frac{\frac{u+3}{3}}{\frac{1}{3} - \frac{u^2}{u+3}}$$

$$17) \frac{\frac{2}{x^2} + \frac{x}{x-5}}{\frac{x}{2x-10}}$$

$$18) \frac{\frac{1}{5} - \frac{5}{2}}{\frac{a+5}{5}}$$

Solve each equation. Remember to check for extraneous solutions.

$$19) \frac{3}{m+3} + \frac{m+2}{m^2+3m} = \frac{m-5}{m^2+3m}$$

$$20) \frac{1}{r^2-r} = \frac{1}{2r-2} - \frac{1}{2r^2-2r}$$

$$21) 1 = \frac{x+5}{x-2} - \frac{x+3}{x-2}$$

$$22) \frac{x-6}{3x^2-9x} + \frac{1}{x^2-3x} = \frac{2}{x-3}$$

$$23) \frac{1}{x} = \frac{1}{x^2+4x} - \frac{x-6}{x^2+4x}$$

$$24) \frac{5}{x^2+6x} - \frac{1}{x} = \frac{5}{x+6}$$

$$25) \frac{1}{p} = \frac{1}{2p-10} - \frac{2}{p^2-5p}$$

$$26) \frac{2}{m} + \frac{1}{m^2-5m} = \frac{5}{m^2-5m}$$

## Answers to Rational Functions Review 3 (ID: 1)

$$1) \frac{3}{7a(a-1)}$$

$$5) \frac{9}{4}$$

$$9) \frac{4k^2 - 12k + 16}{k(k-2)(k-4)}$$

$$13) \frac{5 + 2x^2 + 6x}{5(x+3)}$$

$$17) \frac{4x - 20 + 2x^3}{x^3}$$

$$21) \{4\}$$

$$25) \{6\}$$

$$2) \frac{7n^2(n+5)}{n+2}$$

$$6) \frac{4x^2(x-4)}{x+3}$$

$$10) \frac{2k^2 - 26 - 3k}{3(k+2)(k-2)}$$

$$14) \frac{8x + 24 + 2x^2}{(x+2)(x+6)}$$

$$18) -\frac{23}{2a+10}$$

$$22) \left\{-\frac{3}{5}\right\}$$

$$26) \{7\}$$

$$3) \frac{5}{4}$$

$$7) \frac{8k}{5}$$

$$11) \frac{30n^2 - 114n + 18}{5(n+3)(n-4)}$$

$$15) \frac{6+u}{u^2-3u}$$

$$19) \left\{-\frac{7}{3}\right\}$$

$$23) \left\{\frac{3}{2}\right\}$$

$$4) \frac{x-7}{x+4}$$

$$8) \frac{2}{(n-2)(n-10)}$$

$$12) \frac{30r^2 - 36r - 24}{5(r+4)(r-1)}$$

$$16) \frac{u^2 + 6u + 9}{u+3-3u^2}$$

$$20) \{3\}$$

$$24) \left\{-\frac{1}{6}\right\}$$