

Chapter 11 Concept 1

Name _____

Hr _____

Simplify each expression.

$$1) \frac{9(n+1)}{9n}$$

$$2) \frac{2(x+3)(x+1)}{(x+3)}$$

$$3) \frac{6x+3}{9x-3}$$

$$4) \frac{(2x+3)(x-3)}{(x-3)(3x+1)}$$

$$5) \frac{6v^2+6v}{6v^2-6v}$$

$$6) \frac{2b^2-b-6}{2b^2(b-2)}$$

$$7) \frac{9a+9}{9a^2+15a-6}$$

$$8) \frac{2(x^2-2x-3)}{2(x^2-4x+3)}$$

$$9) \frac{2p+4}{3(p^2+4p+4)}$$

$$10) \frac{6k^2+22k+12}{(3k+1)(k+3)}$$

Chapter 11 Concept 2

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Multiply and simplify each expression.

1.
$$\frac{3}{6(x-1)} \cdot \frac{6x(x-1)}{3(x+3)}$$

2.
$$\frac{3n-2}{3(n-1)(3n-2)} \cdot \frac{3(n+3)(n-1)}{(n+3)}$$

3.
$$\frac{2r+3}{(r-2)(2r+3)} \cdot \frac{(r-3)(3r-1)}{(3r-1)}$$

4.
$$\frac{3m(2m-3)}{2} \cdot \frac{2}{2m^2(2m-3)}$$

5.
$$\frac{1}{3x-2} \cdot \frac{3x^2-8x+4}{2x}$$

6.
$$\frac{2k^2-4k}{3k+3} \cdot \frac{3k+3}{k-2}$$

7.
$$\frac{3}{x+1} \cdot \frac{2x^2-x-3}{2x-3}$$

8.
$$\frac{9a+3}{3} \cdot \frac{a-3}{6a+2}$$

9.
$$\frac{1}{x+1} \cdot \frac{2x^2+2x}{2x}$$

10.
$$\frac{4b-6}{3b^2} \cdot \frac{3b^2}{2b^2+b-6}$$

$$11. \frac{3v^2+8v-3}{9v^2-1} \cdot \frac{3v+1}{v-2}$$

$$12. \frac{2}{4n+4} \cdot \frac{4n+4}{3}$$

$$13. \frac{2b^2+7b+6}{6b-6} \cdot \frac{2b-2}{2b^2+7b+6}$$

$$14. \frac{x^2+x-6}{4x+4} \cdot \frac{4x^2+10x+6}{2x+3}$$

$$15. \frac{6m+4}{9m^3+6m^2} \cdot \frac{2m^2-5m-3}{2m+1}$$

$$16. \frac{9p+6}{2p+4} \cdot \frac{4p-2}{6p^2+p-2}$$

$$17. \frac{3n^2+11n+6}{6n^2+7n+2} \cdot \frac{2n^2-n-1}{n-1}$$

$$18. \frac{3n+1}{9n+3} \cdot \frac{6n^2+6n}{6n+6}$$

Chapter 11 Concept 3

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Divide and simplify each expression.

$$1. \frac{3x-1}{2(3x-1)} \div \frac{(3x+1)}{3x(3x+1)}$$

$$2. \frac{3(2r+3)}{3(3r+2)} \div \frac{2r+3}{2r^2(3r+2)}$$

$$3. \frac{1}{2n+4} \div \frac{2n+1}{6n^3+3n^2}$$

$$4. \frac{3n-3}{6n^2-15n+9} \div \frac{n-2}{2n^2-5n+3}$$

$$5. \frac{4b^2+4b-3}{2b^2-3b+1} \div \frac{4b^2-9}{4b^2-6b}$$

$$6. \frac{2v^2-5v+2}{4v^2-4v+1} \div \frac{3}{2v^2+v-1}$$

Chapter 11 Concept 4

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Add or subtract the expressions. Then, simplify each expression fully.

1.
$$\frac{a-3}{(a-2)(3a-2)} + \frac{a+3}{(a-2)(3a-2)}$$

2.
$$\frac{m-6}{(m+1)(3m-2)} + \frac{2m+3}{(m+1)(3m-2)}$$

3.
$$\frac{3}{(p+3)(p-2)} - \frac{p-2}{(p+3)(p-2)}$$

4.
$$\frac{k-2}{4(k+1)} - \frac{k-3}{4(k+1)}$$

5.
$$\frac{n-1}{2n^2+5n+3} + \frac{2}{2n^2+5n+3}$$

6.
$$\frac{x+1}{4x-12} + \frac{x-3}{4x-12}$$

7.
$$\frac{x-3}{x^2+3x+2} - \frac{x-2}{x^2+3x+2}$$

8.
$$\frac{2m+2}{4m^2-8m} - \frac{m+2}{4m^2-8m}$$

9.
$$\frac{2}{4n-8} - \frac{n-1}{4n-8}$$

10.
$$\frac{r+3}{6r^3+6r^2} - \frac{r-2}{6r^3+6r^2}$$

Chapter 11 Concept 5

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Solve each rational equation using cross-multiplication.

1. $\frac{6}{2} = \frac{p}{4}$

2. $\frac{4}{3} = \frac{k}{5}$

3. $\frac{6}{4} = \frac{3}{x-4}$

4. $\frac{3}{6} = \frac{2n-6}{8}$

5. $\frac{m}{m-7} = \frac{6}{4}$

6. $\frac{8}{r} = \frac{5}{r-7}$

7. $\frac{5}{2x-7} = \frac{4}{x}$

8. $\frac{3}{5} = \frac{n}{7n+6}$

9. $\frac{2}{6} = \frac{7b+8}{b+3}$

10. $\frac{x+8}{3x-2} = \frac{3}{7}$

11. $\frac{6}{r+8} = \frac{3}{5r+8}$

12. $\frac{n-7}{n-4} = \frac{5}{7}$