

**A.A.16: Rational Expressions 4: Simplify fractions with polynomials in the numerator and denominator by factoring both and renaming them to lowest terms**

- 1 The expression  $\frac{9x^4 - 27x^6}{3x^3}$  is equivalent to
- 2 Which expression is equivalent to  $\frac{2x^6 - 18x^4 + 2x^2}{2x^2}$ ?
- 3 Which expression represents  $\frac{2x^2 - 12x}{x - 6}$  in simplest form?
- 4 Which expression represents  $\frac{25x - 125}{x^2 - 25}$  in simplest form?
- 5 Which expression represents  $\frac{x^2 - 3x - 10}{x^2 - 25}$  in simplest form?
- 6 Which expression represents  $\frac{x^2 - 2x - 15}{x^2 + 3x}$  in simplest form?
- 7 Which fraction represents  $\frac{x^2 - 25}{x^2 - x - 20}$  expressed in simplest form?
- 8 The expression  $\frac{2x^2 + 10x - 28}{4x + 28}$  is equivalent to
- 9 Which expression represents  $\frac{x^2 - x - 6}{x^2 - 5x + 6}$  in simplest form?
- 10 Express in simplest form:  $\frac{x^2 - 1}{x^2 + 3x + 2}$
- 11 If the area of a rectangle is represented by  $x^2 + 8x + 15$  and its length is represented by  $x + 5$ , which expression represents the width of the rectangle?
- 12 The area of a rectangle is represented by  $x^2 - 5x - 24$ . If the width of the rectangle is represented by  $x - 8$ , express the length of the rectangle as a binomial.

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## **Answer Section**

1 ANS:

$$3x(1 - 3x^2)$$

$$\frac{9x^4 - 27x^6}{3x^3} = \frac{9x^4(1 - 3x^2)}{3x^3} = 3x(1 - 3x^2)$$

REF: fall0718ia

2 ANS:

$$x^4 - 9x^2 + 1$$

$$\frac{2x^2(x^4 - 9x^2 + 1)}{2x^2}$$

REF: 081222ia

3 ANS:

$$2x$$

$$\frac{2x^2 - 12x}{x - 6} = \frac{2x(x - 6)}{x - 6} = 2x$$

REF: 060824ia

4 ANS:

$$\frac{25}{x + 5}$$

$$\frac{25x - 125}{x^2 - 25} = \frac{25(x - 5)}{(x + 5)(x - 5)} = \frac{25}{x + 5}$$

REF: 080821ia

5 ANS:

$$\frac{-3x - 10}{-25}$$

$$\frac{x^2 - 3x - 10}{x^2 - 25} = \frac{(x - 5)(x + 2)}{(x + 5)(x - 5)} = \frac{x + 2}{x + 5}$$

REF: 061216ia

6 ANS:

$$\frac{x - 5}{x}$$

$$\frac{x^2 - 2x - 15}{x^2 + 3x} = \frac{(x - 5)(x + 3)}{x(x + 3)} = \frac{x - 5}{x}$$

REF: 060921ia

7 ANS:

$$\frac{x+5}{x+4}$$

$$\frac{x^2-25}{x^2-x-20} = \frac{(x+5)(x-5)}{(x+4)(x-5)} = \frac{x+5}{x+4}$$

REF: 011424ia

8 ANS:

$$\frac{x-2}{2}$$

$$\frac{2x^2+10x-28}{4x+28} = \frac{2(x^2+5x-14)}{4x+28} = \frac{2(x+7)(x-2)}{4(x+7)} = \frac{x-2}{2}$$

REF: 011327ia

9 ANS:

$$\frac{x+2}{x-2}$$

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

REF: 011130ia

10 ANS:

$$\frac{x-1}{x+2} \cdot \frac{x^2-1}{x^2+3x+2} = \frac{(x+1)(x-1)}{(x+2)(x+1)}$$

REF: 011233ia

11 ANS:

$$x+3$$

$$\frac{(x+5)(x+3)}{x+5} = x+3$$

REF: 0613071a

12 ANS:

$$\frac{x^2-5x-24}{x-8} = \frac{(x-8)(x+3)}{x-8} = x+3$$

REF: 061131ia