

12.

12.

Divide the rational expressions.

$$\frac{x^2 + 8x + 16}{x + 3} \div \frac{5x^2 + 17x - 12}{1}$$

$$\frac{(x+4)(\cancel{x+4})}{x+3} \cdot \frac{1}{(\cancel{5x-3})(\cancel{x+4})}$$

$$\overbrace{5x^2 + 17x - 12}$$

$$\frac{-60}{2, 30}$$

$$2, 30$$

$$\underbrace{5x^2 - 3x} + \underbrace{20x - 12}$$

$$3, 20$$

$$x(\underline{5x-3}) + 4(\underline{5x-3})$$

$$(\underline{5x-3})(x+4)$$

$$\frac{x+4}{(x+3)(5x-3)}$$

4.

$$\frac{\boxed{cm - cn} + \boxed{3m - 3n}}{\boxed{cm - cn} - \boxed{3m + 3n}}$$

$$\frac{c(m-n) + 3(m-n)}{c(m-n) - 3(m-n)} = \frac{\cancel{(m-n)}(c+3)}{\cancel{(m-n)}(c-3)}$$

$$\frac{c+3}{c-3}$$

16.

$$\frac{6z}{z^2 - 16z + 55} - \frac{5z}{z^2 - 17z + 66}$$

$$\frac{6z(z-6)}{(z-5)(z-11)} - \frac{5z(z-5)}{(z-6)(z-11)(z-5)}$$

$$\frac{6z(z-6) - 5z(z-5)}{(z-5)(z-11)(z-6)}$$

$$\frac{6z^2 - 36z - 5z^2 + 25z}{(z-5)(z-11)(z-6)}$$

$$\frac{z^2 - 11z}{(z-5)(z-11)(z-6)} = \frac{z(z-11)}{(z-5)\cancel{(z-11)}(z-6)}$$

$$\frac{z}{(z-5)(z-6)}$$

19.

$$\frac{\frac{y}{y} \cdot \frac{1}{1} + \frac{6}{y}}{\frac{y^2}{y^2} \cdot \frac{1}{1} - \frac{36}{y^2}} = \frac{\frac{y+6}{y}}{\frac{y^2-36}{y^2}}$$

$$= \frac{\frac{\cancel{y+6}}{\cancel{y}} \cdot \frac{y^2}{(\cancel{y+6})(y-6)}}{1} = \frac{y}{y-6}$$

Chap 10: Quadratic Equations

Note:

$$x^2 + 5x + 6 = 0$$

$$(x+2)(x+3) = 0$$

$$x+2 = 0$$

$$x = -2$$

$$x+3 = 0$$

$$x = -3$$

What about

$$x^2 + 5x + 5 = 0$$

Bother!

What about

$$x^2 = 9$$

$$x = -3, 3 \text{ or } \pm 3$$

$$x^2 = 9$$

$$x^2 - 9 = 0$$

$$(x+3)(x-3) = 0$$

$$x+3=0$$

$$x = -3$$

$$x-3=0$$

$$x = 3$$

$$x^2 = 7$$

$$x = \pm \sqrt{7}$$

Note : \sqrt{x} called "radical x"

means "the positive square
root of x"

$$\sqrt{9} = 3$$

10.1 The Square Root Principle

$x^2=a$ implies $x=a$ or $x=-a$.

You could write $x=\pm\sqrt{a}$

p 780

$$x^2 = 16$$

$$x = 4, -4$$

$$x^2 = 100$$

$$x = 10, -10$$

$$x^2 = 64$$

$$x = 8, -8$$

$$x^2 = 17$$

$$x = \pm\sqrt{17}$$

$$(x+3)^2 = 16$$

$$x+3 = 4$$

$$x = 1$$

$$x+3 = -4$$

$$x = -7$$

$$(x-3)^2 = 25$$

$$x-3 = 5$$

$$x = 8$$

or

$$x-3 = -5$$

$$x = -2$$

$$(x+4)^2 = 7$$

$$x+4 = \sqrt{7}$$

$$x = -4 + \sqrt{7}$$

$$x+4 = -\sqrt{7}$$

$$x = -4 - \sqrt{7}$$

$$\begin{aligned}(x+4)^2 &= (x+4)(x+4) \\ &= x^2 + 4x + 4x + 16 \\ &= x^2 + 8x + 16\end{aligned}$$

$$\begin{aligned}(x-3)^2 &= (x-3)(x-3) \\ &= x^2 - 3x - 3x + 9 \\ &= x^2 - 6x + 9\end{aligned}$$

$$\begin{aligned}(x+a)^2 &= (x+a)(x+a) \\ &= x^2 + ax + ax + a^2 \\ &= x^2 + 2ax + a^2\end{aligned}$$

$$(x+a)^2 =$$

10.2 Solving Quadratic Equations by Completing the Square

p 791

10.3 Solving Quadratic Equations Using the Quadratic Formula

$$ax^2+bx+c=0$$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

discriminant

p 801

10.4 Complex Numbers

Imaginary number

Complex number

Adding and Subtracting Complex Numbers

Multiplying Complex Numbers

p 812

Quadratic Equations with Complex Roots

p 813

