

Warm up 

Solve by factoring

$$7x^2 + 8x + 1 = 0$$

$$\begin{aligned} (7x+1) &= 0 \\ (1x+1) &= 0 \end{aligned}$$

$$X = -1$$

$$X = -\frac{1}{7}$$

Solve Using the Quadratic formula

$$3x^2 + 4x - 5 = 0$$

$$x = \frac{-4 \pm \sqrt{4^2 - 4(3)(-5)}}{2(3)}$$

$$x = \frac{-4 \pm 8.7}{6}$$

$$X = .8, -2.1$$

## Quiz

Solve by Factoring

1)  $(7p - 4)(p + 1) = 0$

2)  $v^2 + v - 2 = 0$

$$\begin{array}{l} 7p - 4 = 0 \\ +4 \quad +4 \\ \hline 7p = 4 \\ p = \frac{4}{7} \\ p + 1 = 0 \\ -1 \quad -1 \\ \hline p = -1 \end{array}$$

$$\begin{array}{l} p = \frac{4}{7} \\ p = -1 \end{array}$$

$$\begin{array}{l} v - 2 = 0 \\ +2 \quad +2 \\ \hline v + 1 = 0 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\begin{array}{l} v^2 - 2 \\ \begin{array}{|c|c|} \hline v & -2 \\ \hline v & 1 \\ \hline \end{array} \end{array}$$

$$v = 2, -1$$

## Complex Operations

Objective: Students will be able to:

Simplify a radical with a negative number

understand what a complex number is

$$\sqrt{-16} = \sqrt{16} \sqrt{-1}$$
$$4\sqrt{-1}$$

$$i = \sqrt{-1}$$

or

$$i^2 = -1$$

Identify the real and imaginary parts of each complex number.

$$3$$
$$\mathbb{R}$$

$$7i$$
$$\mathbb{C}$$

$$5 - i$$
$$\begin{array}{c} \uparrow \\ \mathbb{R} \end{array} \quad \begin{array}{c} \uparrow \\ \mathbb{C} \end{array}$$

Write each of the following as a pure imaginary number.

$$\sqrt{-16} = \sqrt{16}\sqrt{-1} = 4i$$

$$\sqrt{-3} = \sqrt{3}\sqrt{-1} = \sqrt{3}i$$

$$\sqrt[3]{-18} = \sqrt[3]{-27 \cdot 2} = \sqrt[3]{-27} \sqrt[3]{2} = -3\sqrt[3]{2}$$

$$3i\sqrt{2}$$

$$i\sqrt{3}$$

You Try

$$\sqrt{-12}$$

$$\sqrt{-5}$$

$$\sqrt{12} \sqrt{-1}$$

$$\sqrt{5} \sqrt{-1} = i\sqrt{5}$$

$$\begin{array}{c} \swarrow \quad \searrow \\ 3 \quad 4 \\ \swarrow \quad \searrow \\ 2 \quad 2 \end{array} \quad \sqrt{2} \sqrt{-1}$$

$$2i\sqrt{3}$$

$$\sqrt{-36}$$

$$6i$$

$$\begin{array}{c} \swarrow \quad \searrow \\ b \quad b \end{array}$$

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Square Root Property

$$\sqrt{n^2} = \sqrt{36}$$

$$n = 6, -6$$

$$n = \pm 6$$

$$\sqrt{x^2} = \sqrt{24} < \begin{matrix} 6^2 \\ 4^2 \end{matrix}$$

$$x = \pm 2\sqrt{6}$$

$$\sqrt{k^2} = \sqrt{-78}$$

$$k = \pm i\sqrt{78}$$

$$k = \pm 8.8i$$



$$9x^2 - 4 = 77$$
$$+4 \quad +4$$

$$\frac{9x^2}{9} = \frac{81}{9}$$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = \pm 3,$$

$$\frac{5x^2}{5} = \frac{80}{5}$$
$$\sqrt{x^2} = \sqrt{16}$$
$$x = \pm 4$$