

Unit 2 Review - Class Notes

Solve each equation by taking square roots.

1) $5p^2 + 8 = 508$
-8 -8

$$5p^2 = 500$$

÷5

$$p^2 = 100$$

$$p = \pm \sqrt{100}$$

$$p = \pm 10$$

2) $4b^2 + 3 = 163$
-3 -3

$$4b^2 = 160$$

$$\div 4$$

$$b^2 = 40$$

$$b = \pm \sqrt{40}$$

$$b = \pm \sqrt{4 \cdot 10}$$

$$b = \pm \sqrt{4} \cdot \sqrt{10}$$

$$b = \pm 2\sqrt{10}$$

3) $2n^2 - 7 = -19$
+7 +7

$$2n^2 = -12$$

$$\div 2$$

$$n^2 = -6$$

$$n = \pm \sqrt{-6}$$

$$n = \pm i\sqrt{6}$$

Solve each equation by factoring.

4) $x^2 + 9x + 14 = 0$

$$(x+2)(x+7) = 0$$

$$x+2=0 \quad x+7=0$$

-2 -2 -7 -7

$$x = -2$$

$$x = -7$$

5) $x^2 - 5 = -4x$
+4x +4x

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

$$(x-1)(x+5) = 0$$

$$x-1=0$$

$$x=1$$

$$x+5=0$$

$$x=-5$$

$$6) 7k^2 + 18k + 16 = 8$$

$$7k^2 + 18k + 8 = 0$$

$$7k^2 + 4k + 14k + 8 = 0$$

$$(7k^2 + 4k) + (14k + 8) = 0$$

$$k(7k+4) + 2(7k+4) = 0$$

$$(k+2)(7k+4) = 0$$

$$\oplus 7 \cdot 8 = 56$$

$$\begin{array}{r} 1 \quad 56 \\ 2 \quad 28 \\ \hline 4 \quad 14 \\ 7 \quad 8 \end{array}$$

$$(k+2)(7k+4) = 0$$

$$k+2=0$$

$$k = -2$$

$$7k+4=0$$

$$7k = -4$$

$$k = -\frac{4}{7}$$

Find the discriminant of each quadratic equation then state the number and type of solutions.

$$b^2 - 4ac$$

$$7) 9x^2 - 6x - 7 = -8$$

$$9x^2 - 6x + 1 = 0$$

$$a: 9 \quad b: -6 \quad c: 1$$

$$(-6)^2 - (4 \cdot 9 \cdot 1)$$

$$= 36 - 36 = 0$$

1 REAL SOLUTION

$$8) -9x^2 + 10x = 0$$

$$a: -9 \quad b: 10 \quad c: 0$$

$$10^2 - (4 \cdot -9 \cdot 0)$$

$$= 100 - (-36)$$

$$= 136$$

2 REAL SOLUTIONS

$$9) 10b^2 = -5 + 9b$$

$$10b^2 - 9b + 5 = 0$$

$$a: 10 \quad b: -9 \quad c: 5$$

$$(-9)^2 - (4 \cdot 10 \cdot 5)$$

$$= 81 - 200$$

$$= -119$$

2 IMAGINARY SOLUTIONS

Solve each equation with the quadratic formula.

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

10) $5a^2 - 7a + 13 = 11$
 -11 -11

$$5a^2 - 7a + 2 = 0$$

$a=5$ $b=-7$ $c=2$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - (4 \cdot 5 \cdot 2)}}{2(5)}$$

$$x = \frac{7 \pm \sqrt{49 - 40}}{10}$$

$$x = \frac{7 \pm \sqrt{9}}{10}$$

$$x = \frac{7 \pm 3}{10}$$

↙ ↘

$$x = \frac{7+3}{10} \quad x = \frac{7-3}{10}$$

$$= \frac{10}{10}$$

$$= \boxed{1}$$

$$= \frac{4}{10}$$

$$= \boxed{\frac{2}{5}}$$

11) $2b^2 + 5b - 4 = -9$
 +9 +9

$$2b^2 + 5b + 5 = 0$$

$a=2$ $b=5$ $c=5$

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

$$x = \frac{-5 \pm \sqrt{25 - 40}}{4}$$

$$x = \frac{-5 \pm \sqrt{-15}}{4}$$

$$x = \frac{-5 \pm i\sqrt{15}}{4}$$

Solve each equation by completing the square.

12) $n^2 + 14n + 49 = 9$

$-49 -49$

$$n^2 + 14n + \underline{\quad} = -40 + \underline{\quad}$$

$$\left(\frac{b}{a}\right)^2 = \left(\frac{14}{2}\right)^2 = 7^2 = \underline{\underline{49}}$$

$$n^2 + 14n + 49 = -40 + 49$$

$$(n+7)(n+7) = 9$$

$$(n+7)^2 = 9$$

$$n+7 = \pm\sqrt{9}$$

$$\begin{array}{l} \swarrow \\ n+7=3 \\ -7 \quad -7 \end{array}$$

$$\boxed{n=4}$$

$$\begin{array}{l} \searrow \\ n+7=-3 \\ -7 \quad -7 \end{array}$$

$$\boxed{n=-10}$$

Simplify.

13) $-5 - 6i(5 - 3i)$

$$= -5 - 6i - 5 + 3i$$

$$= \boxed{-10 - 3i}$$

14) $(-2 + 6i)^2 = (-2 + 6i)(-2 + 6i)$

$$= 4 - 12i - 12i + 36i^2$$

$$= 4 - 24i + 36(-1)$$

$$= 4 - 24i - 36$$

$$= \boxed{-32 - 24i}$$