

# Adv. Algebra 2 – Concept Quiz

## Form A

### 7. Solving Equations with Square and Cube Roots

a) Solve the equation below.

$$\sqrt[3]{3x-2} + 6 = 2$$

$$\quad \quad -6 \quad -6$$

$$\sqrt[3]{3x-2} = -4$$

$$3x-2 = -64$$

$$\quad +2 \quad +2$$

$$\frac{3x}{3} = \frac{-62}{3}$$

$$x = -\frac{62}{3}$$

Name: \*key

Date: \_\_\_\_\_ Period: \_\_\_\_\_

b) Complete the equation in the first column. If the number of solutions is not possible, write NP.

Equation	Number of Real Solutions
a) $x^2 = \text{neg}$	0
b) $x^2 = 0$	1
c) $x^2 = \text{pos}$	2
d) $x^3 = \text{Any number}$	1
e) $x^3 = \text{NP}$	2
f) $\sqrt[3]{x} = \text{Any Number}$	1
g) $\sqrt{x} = \text{NP}$	2
h) $\sqrt{x} = n \geq 0$	1

### 9. Solving Quadratic Equations

Solve the quadratic equations below using at least 3 different methods.

a)  $2x^2 - 14x - 66 = -6$

$$x^2 - 7x - 33 = -3$$

$$x^2 - 7x - 30 = 0$$

$$(x-10)(x+3) = 0$$

$$x = 10, -3$$

b)  $-3x^2 - 4x = 10$

$$-3x^2 - 4x - 10 = 0$$

$$x = \frac{+4 \pm \sqrt{(-4)^2 - 4(-3)(-10)}}{2(-3)}$$

$$x = \frac{4 \pm \sqrt{104}}{-6}$$

$$\sqrt{104} = \frac{\sqrt{4} \cdot \sqrt{26}}{2\sqrt{26}}$$

$$x = \frac{4 \pm 2i\sqrt{26}}{-6} = \frac{2 \pm i\sqrt{26}}{-3}$$

$$= \frac{-2 \pm i\sqrt{26}}{3}$$

c)  $x^2 - 18x + 99 = 6$

$$x^2 - 18x + 81 = -93 + 81$$

$$(x-9)^2 = -12$$

$$x-9 = \pm\sqrt{-12}$$

$$x = 9 \pm 2i\sqrt{3}$$

$$\sqrt{-12} = \sqrt{-1} \cdot \sqrt{4} \cdot \sqrt{3}$$

$$= i \cdot 2 \cdot \sqrt{3}$$

d)  $x^2 = 32 - 4x$

$$x^2 + 4x - 32 = 0$$

$$(x+8)(x-4) = 0$$

$$x = -8, 4$$

# Adv. Algebra 2 – Concept Quiz

## Form B

### 7. Solving Equations with Square and Cube Roots

a) Solve the equation below.

$$\sqrt[3]{5x+3} + 7 = 4$$

$$\quad \quad -7 \quad -7$$

$$\sqrt[3]{5x+3} = -3$$

$$5x+3 = -27$$

$$\quad -3 \quad -3$$

$$\frac{5x}{5} = \frac{-30}{5}$$

$$x = -6$$

Name: \*key

Date: \_\_\_\_\_ Period: \_\_\_\_\_

b) Complete the equation in the first column. If the number of solutions is not possible, write NP.

Equation	Number of Real Solutions
a) $x^2 = \text{neg}$	0
b) $x^2 = 0$	1
c) $x^2 = \text{pos}$	2
d) $x^3 = \text{any number}$	1
e) $x^3 = \text{NP}$	2
f) $\sqrt[3]{x} = \text{Any number}$	1
g) $\sqrt{x} = \text{NP}$	2
h) $\sqrt{x} = \text{nz}$	1

### 9. Solving Quadratic Equations

Solve the quadratic equations below using at least 3 different methods.

a)  $x^2 + 12x + 79 = -5$

$$x^2 + 12x + 84 = 0$$

$$x^2 + 12x + 36 = -84 + 36$$

$$(x+6)^2 = -48$$

$$x+6 = \pm \sqrt{-48}$$

$$x = -6 \pm 4i\sqrt{3}$$

$$\sqrt{-48} = \sqrt{-1} \cdot \sqrt{16} \cdot \sqrt{3}$$

$$= i \cdot 4 \cdot \sqrt{3}$$

b)  $x^2 = -3x + 18$

$$x^2 + 3x - 18 = 0$$

$$(x+6)(x-3) = 0$$

$$x = -6, 3$$

c)  $6x^2 + 7 = -10x$

$$6x^2 + 10x + 7 = 0$$

$$\frac{-10 \pm \sqrt{(10)^2 - 4(6)(7)}}{2(6)}$$

$$x = \frac{-10 \pm \sqrt{-68}}{12}$$

$$x = \frac{-10 \pm \sqrt{-68}}{12}$$

$$\sqrt{-68} = \sqrt{-1} \sqrt{4} \sqrt{17}$$

$$= i \cdot 2 \cdot \sqrt{17}$$

$$x = \frac{-10 \pm 2i\sqrt{17}}{12} = \frac{-5 \pm i\sqrt{17}}{6}$$

d)  $2x^2 - 20x + 82 = 2$

$$x^2 - 10x + 41 = 1$$

$$x^2 - 10x + 40 = 0$$

$$(x-5)^2 = -15$$

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

$$x = 5 \pm i\sqrt{15}$$