

UNIT 3 REVIEWName: Key Hr. _____**3.1**For Questions 1 and 2, solve each equation by Factoring.

1. $x^2 - 4x - 12 = 0$

$$\begin{array}{r} -12 \\ 6 \times 2 \\ -4 \end{array}$$

$(x+2)(x-6) = 0$

$x+2=0 \quad x-6=0$

$x=-2 \quad x=6$

$\{-2, 6\}$

2. $3x^2 + 24x + 45 = 0$

$$3(x^2 + 8x + 15) = 0$$

x	3
x ²	3x
5x	15

$3(x+5)(x+3) = 0$

$x+5=0 \quad x+3=0$

$x=-5 \quad x=-3$

$\{-5, -3\}$

For Questions 3 and 4, write a quadratic equation with the given roots.

Write the equation in the form $ax^2 + bx + c = 0$, where a , b , and c are integers.

3. $-5, 8$

$(x+5)(x-8) = 0$

$x^2 - 3x - 40 = 0$

4. $\frac{1}{3}, -3$

$(3x-1)(x+3) = 0$

$3x^2 + 8x - 3 = 0$

3.2For Questions 5-8, find the value of the discriminant and describe the number and types of roots. Then, solve the equation by using the Quadratic Formula.

5. $20x^2 + 7x - 3 = 0$

Discriminant: 289

Number & Type of Roots: 2 rational

$$x = \frac{-7 \pm \sqrt{7^2 - 4(20)(-3)}}{2(20)}$$

$$x = \frac{-7 \pm 17}{40}$$

Solutions: $\{\frac{1}{4}, -\frac{3}{5}\}$

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

Discriminant: -3

Number & Type of Roots: 2 complex

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(1)}}{2(1)}$$

$$x = \frac{1 \pm i\sqrt{3}}{2}$$

Solutions: $\{\frac{1 \pm i\sqrt{3}}{2}\}$

7. $x^2 + 8x + 13 = 0$

Discriminant: 12

Number & Type of Roots: 2 irrational

$$x = \frac{-8 \pm \sqrt{8^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-8 \pm 2\sqrt{3}}{2}$$

Solutions: $\{-4 \pm \sqrt{3}\}$

8. $x^2 - 8x + 16 = 0$

Discriminant: 0

Number & Type of Roots: 1 rational

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(16)}}{2(1)}$$

$$x = \frac{8 \pm 0}{2}$$

Solutions: $\{4\}$

9. Solve the quadratic equation using the method of your choice $3x^2 - 4x + 1 = 0$

~~$\frac{3}{-1}$~~ ~~$\frac{-1}{-4}$~~

$3x$	-1
$3x^2$	$-x$
$-3x$	1

$$(3x-1)(x-1) = 0$$

$$3x-1=0 \quad x-1=0$$

$$x = \frac{1}{3} \quad x = 1$$

$\{\frac{1}{3}, 1\}$

$a=3$
 $b=-4$
 $c=1$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(1)}}{2(3)}$$

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

$$x = \frac{4 \pm 2}{6}$$

$\{\frac{1}{3}, 1\}$

10. Solve the quadratic equation using the method of your choice $x^2 + 9x + 20 = 0$

~~$\frac{20}{4}$~~ ~~$\frac{5}{9}$~~

$$(x+4)(x+5) = 0$$

$$x+4=0 \quad x+5=0$$

$$x = -4 \quad x = -5$$

$\{-4, -5\}$

$a=1$
 $b=9$
 $c=20$

$$x = \frac{-9 \pm \sqrt{9^2 - 4(1)(20)}}{2(1)}$$

$$x = \frac{-9 \pm \sqrt{1}}{2}$$

$$x = \frac{-9 \pm 1}{2}$$

$\{-4, -5\}$

11. The base of a triangle is $x+7$, the height of the triangle is $x-2$. The area of the triangle is 26 square centimeters. Find the length of the base

$$A = \frac{1}{2}bh$$

$$26 = \frac{1}{2}(x+7)(x-2)$$

$$52 = x^2 + 5x - 14$$

$$0 = x^2 + 5x - 66$$

$$0 = (x+11)(x-6)$$

$$x+11=0 \quad x-6=0$$

$$x = -11 \quad x = 6$$

Base: 13cm

~~$\frac{-66}{-6}$~~ ~~$\frac{11}{5}$~~

x	-6
x^2	$-6x$
$11x$	-66