

# Algebra Review Solving Quadratics

Name \_\_\_\_\_

## I. Solve by Factoring (any method)

1)  $x^2 - 64 = 0$

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

$x = \pm 8$

$\frac{-16}{-8 \times 2} = -16$

2)  $x^2 - 6x - 16 = 0$

$(x-8)(x+2) = 0$

$x = 8, -2$

3)  $x^2 + 3x = 40$

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

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

$x = -8, 5$

$\frac{-40}{8 \times 5}$

4)  $2x^2 + 3x + 1 = 0$

$(2x^2 + 2x)(x+1) = 0$

$2x(x+1) + 1(x+1) = 0$

$(2x+1)(x+1) = 0$

$x = -\frac{1}{2}, -1$

$\frac{2}{2 \times 3}$

5)  $x^2 - 100 = 0$

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

$x = -10, 10$

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

$x(x+6) = 0$

$x = 0, -6$

## II. Solve by Square Roots

7)  $\sqrt{x^2} = \sqrt{64}$

$x = \pm 8$

8)  $4x^2 = 81$

$\frac{4}{4} \frac{81}{4}$   
 $\sqrt{x^2} = \sqrt{\frac{81}{4}}$

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

9)  $x^2 + 7 = -300$

$\sqrt{x^2} = \sqrt{-307}$

$x = \pm i\sqrt{307}$

10)  $\sqrt{(x-5)^2} = \sqrt{36}$

$x-5 = \pm 6$

$x = 5 \pm 6$

$x = 11, -1$

## III. Solve by using the quadratic formula:

11)  $x^2 + 3x + 2 = 0$

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

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

$x = \frac{-3 \pm 1}{2}$

$x = -1, -2$

12)  $4x^2 - 8x = 1$

$4x^2 - 8x - 1 = 0$

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

$x = \frac{8 \pm \sqrt{80}}{8}$

$x = \frac{8 \pm 4\sqrt{5}}{8}$

$x = \frac{2 \pm \sqrt{5}}{2}$

13)  $x^2 + 8x = 0$

$x = \frac{-8 \pm \sqrt{(8)^2 - 4(1)(0)}}{2(1)}$

$x = \frac{-8 \pm \sqrt{64}}{2}$

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

## IV. Solve these by completing the square:

14)  $x^2 - 2x - 8 = 0$

$x^2 - 2x = 8$

$x^2 - 2x + 1 = 8 + 1$

$\sqrt{(x-1)^2} = \sqrt{9}$

$x-1 = \pm 3$

$x = 1 \pm 3$

$x = 4, -2$

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

$x^2 + 2x = 42$

$x^2 + 2x + 1 = 42 + 1$

$\sqrt{(x+1)^2} = \sqrt{43}$

$x+1 = \pm \sqrt{43}$

$x = -1 \pm \sqrt{43}$

16)  $8x^2 - 16x + 32 = 0$

$\frac{8x^2}{8} - \frac{16x}{8} = \frac{-32}{8}$

$x^2 - 2x = -4$

$(x^2 - 2x + 1) = -4 + 1$

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

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

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

17)  $x^2 + 11x + 18 = 0$

$(x+9)(x+2) = 0$

$x = -9, -2$

$\frac{18}{9 \times 2}$

18)  $x^2 + 2x + 1 = 15$

$\sqrt{(x+1)^2} = \sqrt{15}$

$x+1 = \pm \sqrt{15}$

$x = -1 \pm \sqrt{15}$

21)  $x^2 - 10x + 25 = 0$

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

$x = 5, 5$

19)  $7x^2 - 9x + 1 = 0$

$x = \frac{9 \pm \sqrt{(-9)^2 - 4(7)(1)}}{2(7)}$

$x = \frac{9 \pm \sqrt{53}}{14}$

22)  $x^2 + 3x + 7 = 0$

$x = \frac{-3 \pm \sqrt{(3)^2 - 4(1)(7)}}{2(1)}$

$x = \frac{-3 \pm \sqrt{-19}}{2}$

$x = \frac{-3 \pm i\sqrt{19}}{2}$

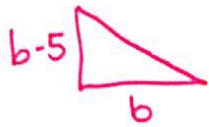
23)  $\sqrt{x^2} = \sqrt{36}$   
 $x = \pm 6$

24)  $x^2 - 6x + 2 = 0$   
 $(-\frac{b}{2})^2$   
 $(-3)^2 x^2 - 6x = -2$   
 $9 x^2 - 6x + 9 = -2 + 9$   
 $\sqrt{(x-3)^2} = \sqrt{7}$   
 $x-3 = \pm\sqrt{7}$   
 $x = 3 \pm \sqrt{7}$

25)  $x^2 - 5x + 4 = 0$   
 $(x-4)(x-1) = 0$   
 $x = 4, 1$

VI. Word Problems:

26) (height) The altitude of a triangle is 5 less than its base. The area of the triangle is 42 square inches. Find its base and altitude.

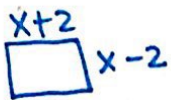


$A = \frac{bh}{2}$   
 $2(42) = \frac{b(b-5)}{2}$   
 $84 = b(b-5)$   
 $84 = b^2 - 5b$

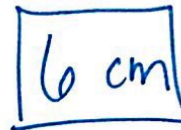
$0 = b^2 - 5b - 84$   
 $0 = (b-12)(b+7)$

$b = 12, -7$   
Base 12 in, Height 7 in

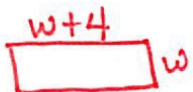
27) If the measure of one side of a square is increased by 2 centimeters and the measure of the adjacent side is decreased by 2 centimeters, the area of the resulting rectangle is 32 square centimeters. Find the measure of one side of the square (the original figure).



$A = lw$   
 $32 = (x+2)(x-2)$   
 $32 = x^2 - 4$   
 $\sqrt{36} = \sqrt{x^2}$   
 $x = \pm 6$



28) The length of a rectangle is 4 m more than the width. The area is 30 m<sup>2</sup>. Find the width and the length.



$A = lw$   
 $30 = w(w+4)$   
 $30 = w^2 + 4w$   
 $0 = w^2 + 4w - 30$

$w = \frac{-4 \pm \sqrt{(4)^2 - 4(1)(-30)}}{2(1)}$   
 $w = \frac{-4 \pm \sqrt{136}}{2}$   
 $w = 3.83, -7.83$

Width 3.83 m, Length 7.83 m

29) The product of two consecutive even integers is 288. Find the two integers.

$x = 1^{st}$   
 $x+2 = 2^{nd}$

$\frac{-288}{18 \times -16}$   
 $\frac{-288}{2}$

$x(x+2) = 288$   
 $x^2 + 2x = 288$   
 $x^2 + 2x - 288 = 0$   
 $(x+18)(x-16) = 0$   
 $x = -18, 16$

