

Name: _____
Block: _____

**Algebra 2H: Quadratic Equations
Practice test**

1. There are total of 22 questions in this test.
2. Each of the first 20 worth 2 points:
 - a. The first 16 relate directly to the present chapter.
 - b. The last 4 questions relate mostly to other subjects we covered this year.
3. Extra-credit: There are TWO extra-credit question, worth 1pt each.
4. You have 50 minutes (one Block) to complete the test (more if you have accommodations).

You are allowed to use a calculator.

==> You have to SHOW YOUR WORK for full credit. Either on the space given here, or on extra paper.

Results WITHOUT showing your work might not get full credit.

Therefore, writing on the white-board might be redundant, as you will have to copy something back to paper.

Good luck!!

-Zachi

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Helper section

The general form of equation for vertical motion is:

$$h(t) = -16t^2 + v_0t + h_0$$

where:

$h(t)$ - Height at time t , in units of feet

v_0 - Starting (initial) vertical velocity, in units of feet-per-second

h_0 - Starting (initial) height, in units of feet

t - Time, in units of second

The time to reach maximum height is

$$t_{maxHeight} = \frac{v_0}{32}$$

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Name: _____

Practice Test

Block: _____

=== Start of test

1) Solve by factoring (MATH method, box, or similar)

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

2) Solve by factoring (MATH method, box, or similar)

$$4x^2 - 7x + 3 = 0$$

3) Solve by completing the square.

$$y^2 + 6y + 12 = 0$$

4) Solve by completing the square.

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

Name: _____
Block: _____

5) Solve using the quadratic equation formula.

$$u^2 = 6u - 2$$

6) Solve using the quadratic equation formula.

$$x^2 + x + 2 = 0$$

7) Solve in whichever method you choose (and SHOW your work)

$$a^2 + a \cdot 2\sqrt{2} - 2 = 0$$

8) Solve in whichever method you choose (and SHOW your work).

$$2y^2 - 4 = 3y^2 - 20$$

Name: _____
Block: _____

9) Solve.

$$\sqrt[5]{t^2} + 5\sqrt[5]{t} + 6 = 0$$

10) For each of the below, determine if the equation has one or two solutions, and whether these are real or complex. You do not need to solve the equations.

(a) $4m^2 + 7m = 0$

(b) $x^2 + 3x + 4 = 0$

(c) $4x^2 + 3 = 4x\sqrt{3}$

11) Write a quadratic equation for which the solutions satisfy the below:

(a) Sum of solution is π , and product is $\frac{1}{4}$.

(b) There is only one solution, equal to $\sqrt{7}$.

(c) Two complex solutions, one of which is $2 + i\sqrt{3}$.

Name: _____

Practice Test

Block: _____

12) The hypotenuse of a right triangle is 25km long. The length of one leg is 17km less than the other. Find the lengths of the legs.

13) Trains A and B leave the same city at the same time, headed east and north respectively. Train B travels 5 miles/hour faster than train A. After 2 hours they are 50 miles apart. Find the speed of each train.

14) Solve for the indicated letter:

(a) $k = \frac{1}{5+t^2}$; t

(b) $A = \pi r s + \pi r^2$; r

15) An object is launched directly upward at 64 feet per second (ft/s) from a platform 80 feet high.

(a) When will the object attain its maximum height?

(b) What will be the object's maximum height?

Name: _____
Block: _____

- 16) One of the games at a carnival involves trying to ring a bell with a ball by hitting a lever that propels the ball into the air. The height of the ball is modeled by the equation

$$h(t) = -16t^2 + 39t$$

(where h is in feet, and t is in seconds). If the bell is 25 ft. above the ground, will it be hit by the ball?

- 17) Question 17-20 are on the following subjects. You do have all the quizzes and tests we have done this year to help you with practice questions. PLEASE make sure you are familiar with all of the terms below.

- a. Sequence, Series: Arithmetic, Geometric, Σ notation, sum of arithmetic series
Specifically: **Make sure you know how to solve something like:**

$$\sum_{n=1}^{20} (5n + 1) = ?$$

- b. Lines: Through a point w/ a given slope, through two points, slope, perpendicular, parallel
c. Relations, Functions, 1-1 Function. Function composition.
d. System of equations: Substitution, elimination, consistent, inconsistent.
e. Polynomial equations (e.g., : $m^2 = 4m$)
f. Rational expressions : Divide polynomial (synthetic or regular), simple ones. Simplify. Solve.

Make sure you know how to solve:

$$\frac{2}{x-1} + \frac{4}{x+1} = \frac{16}{x^2-1}$$

- g. Radicals, Rational exponents, and complex numbers : This was our previous chapter!!

Extra-credit : Yes, we'll have that as well. Not too hard, and two of these!! You should definitely try them.

=== End of test