

Algebra 8 SIWS Unit Test

Name: _____ Period: _____ Date: _____

Show all work! Label units where needed. Each question is worth 5 points unless otherwise noted. Read carefully and think critically!

Superior Ball Company manufactures soccer balls. They have the following income and expenses for manufacturing n soccer balls.

$$I = 9n$$

$$E = 2(2n + 3500)$$

1.) Write an equation for the profit P for manufacturing n soccer balls. **Simplify your equation.**

2.) How much profit will the company make if it sells 4,200 soccer balls?

3.) The company wants to make at least \$50,000. How many soccer balls must they sell?

4.) How many soccer balls must be sold for the company to **break even**?

State whether each equation below represents a linear, quadratic, or exponential equation and **explain how you know**.

5.) $y = 3(x - 5) + 9(4 - x)$

6.) $y = x^2 - 12$

7.) $y = \frac{(.4)^x}{10}$

8.) $y = (x + 4)(-2x + 5)$

Using the two equations, write a new equation relating the given variables. Think about what variable you **don't** want and how you can use the second equation to help you eliminate that variable.

9.) y in terms of z .

$$y = 3x + 8z$$

$$x = 4z - 5$$

10.) A in terms of B .

$$A = 3B + 2C$$

$$2B - 4C = 10B + 24$$

Solve for the given variable.

11.) $x^2 + 2x = 24$

12.) $3(x + 5) + 5(x + 2) = 0$

13.) $2x^2 + 7x - 9 = 0$

14.) $-2(7x + 15) = 18 + 2x$

You are trying to launch a stomp rocket over your house from ground level. The path of the rocket as it travels through the air can be modeled by the equation below.

$$h = -16t^2 + 96t$$

15.) How high off the ground is the rocket at .5 seconds?

16.) Write the equation in factored form.

17.) Using your factored form, calculate how long the stomp rocket is in the air. **Making a table or guessing and checking will not be acceptable strategies.**

18.) The house you are trying to clear is about 145 feet tall at its highest point. Will your stomp rocket be able to clear it?