

Algebra 8 SIWS Unit Test

Name: _____ Period: _____ Date: _____

Show all work! Label units where needed. Each question is worth 5 points. 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 wherever possible.**

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.) $y = (.4)^x$

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.) $0 = x^2 + 2x - 24$

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

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

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

Mr. Andrews is trying to dunk a basketball. In order to save himself some embarrassment if he misses, he decides to come up with an equation first rather than go out onto the court. He takes some practice jumps in his room and comes up with the following equation that models the height of his feet h as a function of time t :

$$h = -8t^2 + 10t$$

15.) How high off the ground are Mr. Andrews' feet at .4 seconds?

16.) Write the equation in factored form.

17.) Using your factored form, calculate how long Mr. Andrews is in the air. **Making a table will not be an acceptable strategy.**

18.) Based on his height and arm length, Mr. Andrews calculates that he needs to jump 3.25 feet in the air in order to dunk the ball. Does he dunk the basketball like a champ or does he put up a brick and come crashing down in a pile of embarrassment?