Name_____ Class _____ Date _____

4-5 Practice

Form G

Quadratic Equations

Solve each equation by factoring. Check your answers.

1. $x^2 - 2x - 24 = 0$

2. $3x^2 = x + 4$

3. $x^2 - 6x + 9 = 0$

4. $3x^2 + 45 = 24x$

5. $4x^2 + 6x = 0$

6. $7x^2 = 21x$

7. $(x + 2)^2 = 49$

8. $x + 3 = 24x^2$

21. A woman drops a front door key to her husband from their apartment window several stories above the ground. The function $h = -16t^2 + 64$ gives the height h of the key in feet, t seconds after she releases it.

a. How long does it take the key to reach the ground?

b. What are the reasonable domain and range for the function h?

22. The function $C = 75x + 2600$ gives the cost, in dollars, for a small company to manufacture x items. The function $R = 225x - x^2$ gives the revenue, also in dollars, for selling x items. How many items should the company produce so that the cost and revenue are equal?

23. The function $a = 2.4t - 0.1t^2$ gives the amount a, in micromilligrams (mmg), of a drug in a patient's bloodstream t hours after being ingested in tablet form. When is the amount of the drug equal to 8 mmg? (*Hint:* Multiply the equation you write by 10 before solving.)

24. You use a rectangular piece of cardboard measuring 20 in. by 30 in. to construct a box. You cut squares with sides x in. from each corner of the piece of cardboard and then fold up the sides to form the bottom.

a. Write a function A representing the area of the base of the box in terms of x.

b. What is a reasonable domain for the function A?

c. Write an equation if the area of the base must be 416 in.^{2}.

d. Solve the equation in part (c) for values of x in the reasonable domain.

e. What are the dimensions of the base of the box?