T-2 Review A&B for Benchmark Exam Algebra Honors

1. The base of a triangle is x feet and the height is (2 + 2x) feet. The area of the triangle is 30 square feet. What are the dimensions of the triangle?

2. How many liters of a 30% acid solution must be added to 80 L of a 20% solution to produce a 28% acid solution?

3. A plane goes 2000 miles in five hours flying against the wind. The same plane takes four hours to fly the same distance with the wind. What's the rate of the plane in still air, and the rate of the air current?

4. If an object is thrown upward with a velocity of 80 ft/sec from ground level how long will it take to return to ground level? What is the greatest height the ball will be?

5. Identify the sequence and write the rule:

$3, 9, 15, 21, \ldots$

6. Identify the sequence and write the rule:

$128, 96, 72, 54, \ldots$
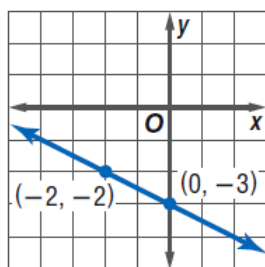
7. Solve for the variable:

a. $64^{2x+4} = 16^{5x}$ b. $7^n 7^4 = 49^6$

8. Simplify:

a. $8^{\frac{2}{3}}$ b. $25^{3/2}$

9. Write an equation in slope-intercept form of the line perpendicular to the line shown that passes through (8, -4).

10. Write the equation of the line passing through the points given. $(8, -1), (7, -1)$

State if the system has *one solution*, *no solution* or *infinitely many solutions*. If it has one solution, name it.

11. $y = 3x \ and \ 4x + 2y = 30$

12. $x + y = 6 \ and \ 3x + 3y = 3$

13. $\frac{2}{3}x + \frac{1}{2}y = 2 \ and \ 4x + 3y = 12$

Solve the system of equations:

14. $x + 6y = 1 \ and \ 3x - 10y = 31$

15. $3x - 5y = 8 \ and \ 4x - 7y = 10$

16. Solve the system of inequalities by graphing.

$y \le x \ and \ x + y \ < 4 \ and \ y \ \ge -3$

17. Graph $y = -\left(\frac{1}{3}\right)^x$

18. Determine whether the function represents exponential growth or decay and identify the percent rate of change:

a. $y = 4(0.6)^t$ b. $y = 500(1.035)^t$

19. Write a function that represents the situation:

A population of 10,000 decreases by 2% each year

20. Evaluate the function for the given value of x:

$f(x) = \frac{2}{3}(6)^x \ \ x = 3$

Simplify.

21. $\frac{3}{4}x^2\left(\frac{2}{3}xy^3z\right)$ 22. $-16x^{-6}y^0$

23. $\left(\frac{x^3y^4}{2x^5}\right)^{-3} \bullet \left(\frac{3x^{-2}}{2y^4}\right)$

24. State the degree and name each polynomial.

a. $5x^2 + 3x - 7$

b. -18

c. $5k - k^3$

d. $3x - 5$

25-28 Find the product.

25. $(4a + 3)(2a - 1)$

26. $(x - 2)(x^2 + 2x + 4)$

27. $(8a - 2b)(8a + 2b)$

28. $\left(\frac{1}{4}x + 4\right)^2$

29. Graph $y = 2x^2 - 4x + 5$

30. Find the minimum or maximum of the given function:

$f(x) = -3x^2 + 12x + 17$