AFM Midterm Review 2013 Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Write an exponential function to model this situation: a population of 420 animals **decrease** at an annual rate of 21%. Then predict the value of the function after 5 years (to the nearest whole number).

 A) f(x) = 420(0.79)x; 1659 animals B) f(x) = 420(1.21)x; 2541 animals

 C) f(x) = 420(0.79)x; 129 animals D) f(x) = 420(1.21)x; 1089 animals

2. Evaluate the expression: 

 A) -1 B) 1 C) 0 D) 5

3. Given a triangle with b = 5, c = 6, and A = 122, what is the length of a? (Round to 2 decimal places.)

 A) 5.36 B) 9.63 C) 5.4 D) 8.77

4. How many triangles can be constructed with B = , a = 5, and b = 3 ?

 A) 0 B) 1 C) 2 D) 3

5. From the top of a 120 ft lighthouse, the angle of depression to a ship in the ocean is 15°. How far is the ship from the base of the lighthouse?

 A) 769 feet B) 448 feet C) 464 feet D) 32 feet

6. A 90 ft tree casts a shadow that is 20 feet long. What is the angle of elevation of the sun (to the nearest degree)?

 A) 13° B) 77° C) 90° D) 62°

7. The sides of a triangle are 21, 36, and 33 m. Find the largest angle.

 A) 82.3° B) 79.3° C) 81.3° D) 80.3°

8. The population of a town can be represented by the formula, where P(t) represents the

 population, *in thousands*, and t represents the time in years, since 1990. What does the slope represent?

1. In 1990, the population was 23720 people.
2. The population decreases by five people every three years.
3. The population increases by three thousand people every five years.
4. The population decreases by five thousand every three years.
5. The population increases by five thousand every three years.

9. The population of a town can be represented by the formula, where P(t) represents the

 population, *in thousands*, and t represents the time in years, since 1990. What does the y-intercept represent?

1. 23.72 people started the town
2. In 1990, the population of the town was 23.72 people.
3. In 1990, the population of the town was 23720 people.
4. The starting population was 5/3 people.

10. Find an equation for the line that is parallel to  and passes through the point (-8, 2).

 A) 2x – 3y = -27 B) 3x - 4y = -32 C) 4x + 3y = 8 D) 3x – 4y = 36

11. The difference of the squares of two consecutive even integers is 580.

 Which equation would be used to correctly solve this problem?

 A)  C) 

B)  D) 

Use the following problem to answer questions 12-13.

The height h of a ball dropped above ground after t seconds is given by the formula, , where  is the initial height of the ball. Suppose a ball is dropped from the top of a 256 foot building.

12. After 2 seconds, what is the height of the ball?

 A) 1280 ft B) 192 ft C) 64 ft D) 160 ft

13. Find the time it takes for the ball to reach the ground.

 A) 2.8 sec B) 4 sec C) 0 sec D) 3.8 sec

14. Find f(-2) when f(x) = .

 A) -16 B) 20 C) –8 D) 12

15. Find  when f(x) = 

1. 10h + 5a
2. 5h + 10a
3. 5h + 5a
4. 10h – 5a

16. Evaluate the following piecewise defined function at f(0), f(2), and f(8).

 f(x) = {6 if x < 2}

 {3x-8 if x 2}

1. f(0)=6, f(2) = -2, f(8)= 32 C) f(0)=6, f(2)= 2, f(8)= 16

B) f(0)= -8, f(2)=6, f(8)= 6 D) f(0)=6, f(2) = -2, f(8)= 16

17. Which of the following formulas is a formula

 for the function y = f(x) shown at the right?

A) B) C)  D) 

18. Find the domain of the following function, f(x) = .

 A) 

 B) 

 C) 

 D) 

19. Find the domain of the following function:

 f(x) =

 A) 

 B) 

 C) 

D) 

20. Juliet plans to buy a supply of blank compact discs. She checked price lists and found out that if she bought 100 CD’s or less that it would cost her $.70 each. However, if she buys between 100 and 200 CD’s, the price drops to $.65 each for the second hundred. Also, for any purchase of more than 200, the price drops again to $.61 for each one over 200. What is the cost for Juliet to purchase 260 compact discs?

 A) $152.00

 B) $182.00

 C) $158.60

 D) $171.60

21. If the function f(x)=  is reflected over the x-axis, shifted to the left 2 units and shifted up 3 units, what new function, g(x) should be obtained?

1. g(x)=
2. g(x)=
3. g(x)=
4. g(x)=

22. The graph of a function is given to the side.

 Determine the interval on which the function is increasing.

1. (-3, 3)
2. (-3, 5) U (1, 3)
3. (-6, -3) U (3, 6)
4. (-6, 6)

23. This graph represents a translation of the graph of y = |x|. What is the equation of this graph?

 A) y = |x – 3| B) y = –|x – 3| C) y = |–x + 3| D) y = –|x + 3|

1. Evaluate: 

 A. 3 B. -3 C. -4 D. 

1. A house bought five years ago for $100,000 was just sold for $135,000. To the nearest tenth of a percent, what was the annual growth rate?

 A. 6.2% B. 106.2% C. 93.8% D. 35%

1. The half-life of a certain radioactive material is 85 days. An initial amount of the material has a mass of 801 kg. Find how much radioactive material remains after 10 days. Round your answer to the nearest thousandth.

 A. 0.228 kg B. 0 kg C. 738.273 kg D. 0.782 kg

1. How many years will it take for $1600 to grow to $28,900 at an interest rate of 4.4% if the interest rate is compounded quarterly? Round the number of years to the nearest hundredth.

 A. 67.21 years B. 66.13 years C. 264.52 years D. 412.77 years

1. Solve  Round the solution to the nearest hundredth.

 A. 1.42 B.  C. 5.73 D. 9.97

1. Solve . Round the solution to the nearest hundredth.

 A. 0.57 B. 1.74 C. 0.05 D. 0.25

 30. Find the equation of a line in standard form that passes through the points (-3, -1) and (2, 4).

 A. x – 2y = -1 B) x – y = -2 C) 3x – 2y = 1 D) 3x – 3y = -1

31. Find the equation of the line parallel to x + 2y = 5 and has y-intercept 3.

 A) x + 2y = 6 B) 3x – y = 2 C) 2x + 2y = 3 D) x + y = 2

32. Change from logarithmic form to exponential form: 

 A)  B)  C)  D) 

33. Convert from exponential form to logarithmic form: 

 A)  B)  C)  D) 

34. . Evaluate:  = \_\_\_\_\_\_\_\_\_\_

35. Solve the logarithmic equations, accurate to 4 decimal places. (3 problems here!!)

 a)  b)  c) 

 x = \_\_\_\_\_\_\_\_\_\_\_\_\_ x = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ x = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

36. If ∠*P* = 27°, ∠R = 90°, and *r* = 11, find *p*.

 a) 24.2 b) 5.6 c) 9.8 d) 5.0

37. The angle of elevation of a ladder leaning against a wall is 55°. The ladder is 30 feet long. How high up the wall does it reach?

 a) About 52.30 ft b) about 17.21 ft c) about 24.57 ft d) about 42.8 ft

38.  In ∆ABC, find *c* if ∠*A* = 36°, ∠*B* = 101°, and *b* = 42.7.

a) about 40.2 b) about 29.7 c) about 25.3 d) about 31.8

39. Determine the number of possible solutions for ∆ABC, given ∠*A* = 40°, *a* = 7, and *b* = 9.

a) two b) one c) three d) none

40. Determine the number of possible solutions for ∆ABC, given *a* = 7, *b* = 3, and ∠*A* = 115°.

a) two b) one c) three d) none

41. In ∆ABC, given *a* = 22, *b* = 39 and *c* = 19, find *B*.

a) about 144° b) about 126° c) about 36° d) about 54°