

Math 100

Practice Test #1

Spring 2023

Name \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1)  $2.59 \times 10^{-6}$  written in decimal notation is: [SEC 1.1]

0.00000259

- A) None of these    B) 0.0259    C) 0.0000259    D) 0.00259    E) 0.00000259

2) 6,700,000 written in scientific notation is: [SEC 1.1]  
 $6.7 \times 10^6$

- A)  $6.7 \times 10^{-7}$     B)  $6.7 \times 10^7$     C)  $6.7 \times 10^{-6}$     D)  $6.7 \times 10^6$     E) None of these

3) Which of the following values is the greatest? [SEC 1.1]

- A) 0.005    B) 0.00005    C)  $5.0 \times 10^{-4}$     D) 0.05    E)  $5 \times 10^{-3}$   
0.0005    0.0005

4) Sears is having an after Christmas sale on bikes. For January only, the price for a \$250 bike is reduced 40%. What is the sales price of the bike? [SEC 1.2]

$$\text{SALES PRICE} = \text{RETAIL PRICE} - \text{DISCOUNT}$$

$$\begin{aligned} \text{SALES PRICE} &= \$250 - 40\%(\$250) \\ &= \$250 - 0.40(\$250) \\ &= \$250 - \$100 \end{aligned}$$

- A) \$150    B) \$100    C) None of these    D) \$125    E) \$175  
= \$150

- 5) If the purchase price of a cart full of items at WalMart is \$135.56 before tax, what was the final price of the items after the 5% sales tax is applied in Virginia? [SEC 1.2]

$$\text{RETAIL PRICE} = \text{WHOLESALE PRICE} + \text{MARKUP}$$

$$\begin{aligned}
 &= \$135.56 + 5\% (\$135.56) \\
 &= \$135.56 + 0.05 (\$135.56) \\
 &= \$135.56 + \$6.78 = \$142.34
 \end{aligned}$$

- A) \$6.78      B) \$142.34      C) None of these      D) \$139.76      E) \$163.23

- 6) The retail price of a lawn mower is \$550. The markup is 45%. What is the wholesale price of the lawn mower? [SEC 1.2]

$$\text{RETAIL PRICE} = \text{WHOLESALE PRICE} + \text{MARKUP}$$

$$\begin{aligned}
 \$550 &= X + 45\% X \\
 \$550 &= 1X + 0.45X \\
 \frac{\$550}{1.45} &= \frac{1.45X}{1.45} && X = \$379.31
 \end{aligned}$$

- A) \$797.50      B) \$379.31      C) \$1000.00      D) \$1797.50      E) None of these

- 7) The sales price of a jacket is \$135.50. If it was marked down 30%, what was the retail price of the jacket before it went on sale?

$$\text{SALES PRICE} = \text{RETAIL PRICE} - \text{DISCOUNT}$$

$$\begin{aligned}
 \$135.50 &= X - 30\% X \\
 \$135.50 &= 1X - 0.30X
 \end{aligned}$$

- A) \$193.57      B) None of these      C) \$176.15      D) \$154.86      E) \$94.85

$$\begin{aligned}
 \frac{\$135.50}{0.70} &= \frac{0.70X}{0.70} \\
 \$193.57 &= X
 \end{aligned}$$

Find the slope of the line that goes through the pair of points.

8) (2, -2) and (6, 6)

[SEC 1.4]

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{6 - (-2)}{6 - 2} = \frac{8}{4} = 2$$

- A) -2
- B) Undefined
- C) 1
- D) 2
- E) None of these

9) What would the graph of model  $y = -4x + 25$  yield? [SEC 1.4]

- A) An increasing linear model.
  - C) A decreasing linear model.
  - B) A parabola that opens up.
  - D) A parabola that opens down.
- 10) A salesperson weekly, commission based salary is represented using the following model (where S represents the salary and x represents the number of items sold during a week). [SEC 1.4]

$$S(x) = 300 + 40x$$

What does this equation mean?

- A) The weekly salary of the salesperson is \$300 minus \$40 for each sale that is made during the week.
- B) The weekly salary of the salesperson is \$40 plus \$300 for each sale that is made during the week.
- C) The weekly salary of the salesperson is \$300 plus \$40 for each sale that is made during the week.
- D) The weekly salary of the salesperson is \$300 for each sale that is made during the week.
- E) None of the above

11) Using the model in question #11, what is the weekly salary of the salesperson if 25 items were sold? [SEC 1.4]

$$S(x) = \$300 + \$40x$$

$$S(25) = \$300 + \$40(25)$$

$$S(25) = \$300 + \$1000 = \$1300$$

A) \$300

B) \$1000

C) \$400

D) \$1300

E) None of these

Find the coordinate of the vertex of the parabola. [SEC 1.5]

12)  $y = 2x^2 - 8x + 9$

X-COORDINATE:  $x = \frac{-b}{2a} = \frac{-(-8)}{2(2)} = \frac{8}{4} = 2$

Y-COORDINATE:  $2(2)^2 - 8(2) + 9 = 2(4) - 16 + 9 = 1$

A) (2,1)

~~B) (-2,-1)~~

~~C) (1,2)~~

~~D) (-1,2)~~

E) None of these

13) In problem #12 the graph of the equation would yield: [SEC 1.5]

A) A line that decreases from left to right

B) A parabola that opens down

C) A parabola that opens up

D) None of these

E) A line that increases from left to right

$2x^2$

14)  $f(x) = 4x + 8 + 5x^2$  is given the given function. What would the graph be? [SEC 1.5]

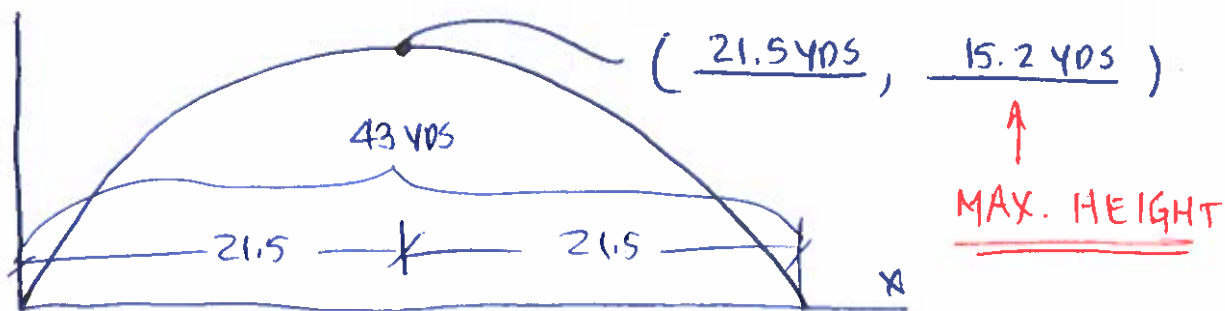
A) Linear function that decreases from left to right

B) Quadratic function: Parabola that opens up

C) Quadratic function: Parabola that opens down

D) Linear function that increases from left to right

- 15) The formula  $y = -0.033x^2 + 1.42x$  gives the distance  $y$ , in yards, that a football is kicked into the air where  $x$  is the horizontal distance the football travels in yards along the ground. How far did the ball travel along the ground?



X-COORDINATE:  $x = -\frac{b}{2a} = \frac{-1.42}{2(-0.033)} = \frac{-1.42}{-0.066}$

Y-COORDINATE:  $y = -0.033(21.5)^2 + 1.42(21.5) = 21.5$

$y = -0.033(462.25) + 30.5$

$y = -15.3 + 30.5$

$y = 15.2$

- 16) If graphed, the model:  $y = -2x^2 + 17$  would be: [SEC 1.5]

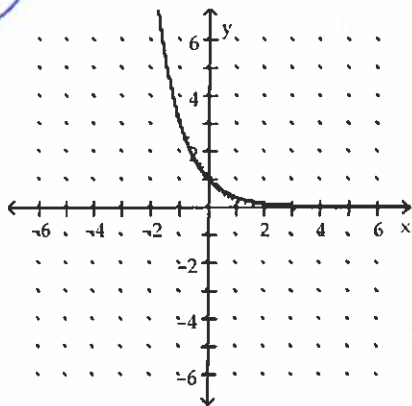
- A) A graph that would decrease linearly
- B) A graph that would decrease exponentially
- C) A graph of a parabola that opens down.
- D) A graph that would increase exponentially
- E) A graph of a parabola that opens up

Graph the function. [SEC 1.6]

17)  $f(x) = \left(\frac{1}{4}\right)^x$

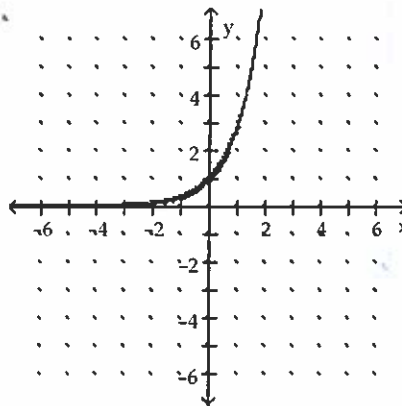
EXPONENT

A)

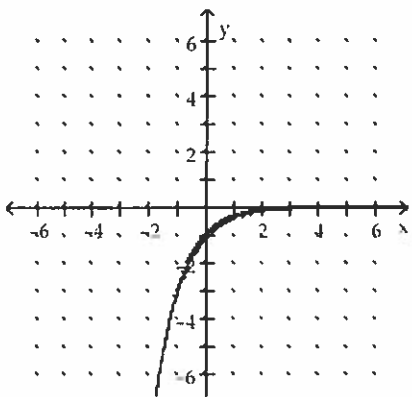


$y = (0.25)^x$   
 $b < 1$

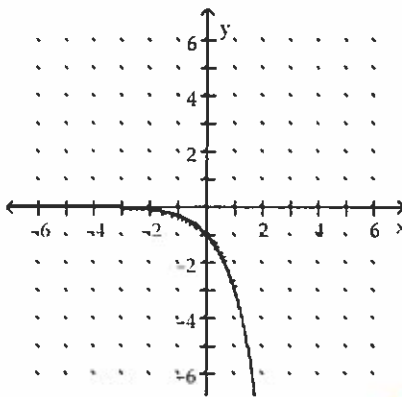
B)



C)



D)



18) Since 1970, the growth in the U.S. population in millions closely fits the exponential function  $P(t) = 200e^{0.018t}$ , where  $t$  is the number of years since 1970. Estimate the population in the year 2020. [SEC 1.6]

$t = 2020 - 1970 = 50$

$P(t) = 200e^{0.018t}$   
 $P(50) = 200(2.718)^{0.018(50)}$   
 $P(50) = 200(2.718)^{0.9}$   
 $P(50) = 200(2.459)$   
 $= 491.8$

A) 237 million

B) 332 million

C) 554 million

D) 876 million

E) 492 million

19) A dot com company estimates that its stock value from the time of its initial public offering (IPO) follows the function  $V(t) = e^{0.15t} + 15$  where  $V(t)$  represents the value in year  $t$ , with  $t = 0$  being 1996. Estimate the stock value in year 2015. [SEC 1.6]

$t = 2015 - 1996 = 19 \text{ yrs}$

$$V(t) = e^{0.15t} + 15$$

$$V(19) = 2.718^{2.85} + 15$$

$$V(19) = 2.718 + 15 = 17.28 + 15 = \$32.28$$

- A) About \$34      **B) About \$32**      C) About \$23      D) About \$56      E) About \$12

Convert to logarithmic form. [SEC 1.7]

20)  $5^4 = 625$

$$\log_5(625) = 4$$

- A)  $\log_4 625 = 5$       **B)  $\log_5 625 = 4$**       C)  $\log_{625} 5 = 4$       D) None of these

Convert to exponential form. [SEC 1.7]

21)  $\log 10,000 = 4$

$$10^4 = 10,000$$

- A)  $4^3 = 10,000$       **B)  $10^4 = 10,000$**       C)  $1000^1 = 1000$       D)  $10^2 = 100$       E) None of these

22) Evaluate  $\ln(125)$  to four decimal places. [SEC 1.7]

- A) 0.23971      B) 2.5675      C) 3.5263      **D) 4.8283**

23) Write the equation  $(3)^{-2} = \frac{1}{9}$  in logarithmic form. [SEC 1.7]

$$\log_3\left(\frac{1}{9}\right) = -2$$

- A)  $\log_{-2}\left(\frac{1}{9}\right) = 3$       B)  $\log_3\left(\frac{1}{9}\right) = 2$       C)  $\log_{-3}\left(\frac{1}{9}\right) = 2$       **D)  $\log_3\left(\frac{1}{9}\right) = -2$**

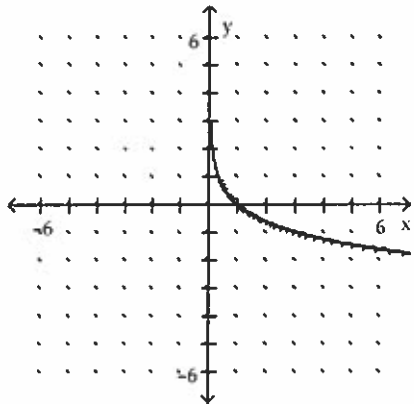
24)  $\log(72)$  [SEC 1.7]

- A) 1.857**      B) None of these      C) 1      D) 4.277      E) 0.4343

Graph the function. [SEC 1.6]

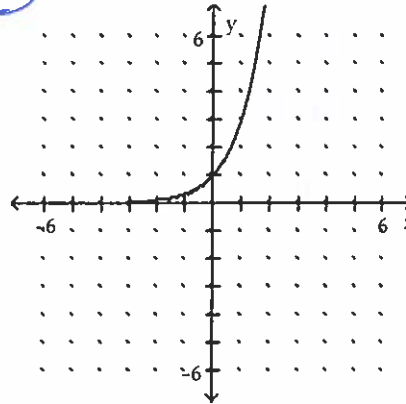
25)  $y = e^x \rightarrow y = (2.718)^x$

A)

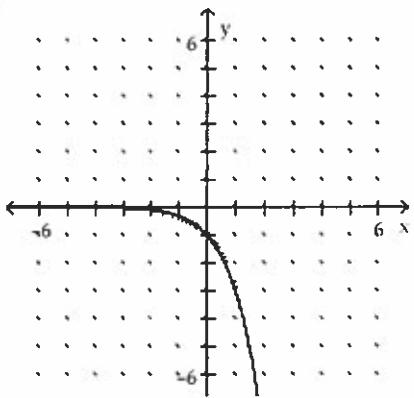


$b > 1$

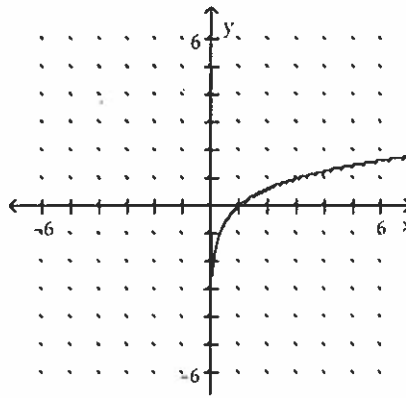
B)



C)



D)



Solve the problem below.

26) The approximate percentage of a girl's adult height that she has reached at age  $x$  is given by the model

$P = 29 + 48.8 \log(x + 1)$

where  $P$  is the percentage of adult height and  $x$  is the age of the girl. What percentage of adult height has the girl reached at age 10? [SEC 1.7]

$P = 29 + 48.8 \log(10 + 1)$

$P = 29 + 48.8 \log(11)$

$P = 29 + 48.8(1.041)$

$P = 29 + 50.8$

$P = 79.8\%$

- A) 79.8%
- B) None of these
- C) 65.5%
- D) 72.3%
- E) 84.5%