Math 100

Practice Test #1 Solutions

Spring 2022

Name_____

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

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

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]

6.7×10^{6}

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

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

A) 0.005 B) 0.00005 C) 5.0×10^{-4} D) 0.05 E) 5×10^{-3}

$5.0 \times 10^{-4} = 0.0005$

$5 \times 10^{-3} = 0.005$

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]

SALES PRICE = RETAIL PRICE − DISCOUNT

SALES PRICE = \$250 − 40%(\$250)

= \$250 − 0.40(\$250)

= \$250 − \$100

= \$150

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

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? [SEC1.2]

RETAIL PRICE = WHOLESALE PRICE + MARKUP

= $135.56 + 10% ($135.56)

= $135.56 + 0.05 ($135.56)

= $135.56 + $6.78 = $142.34

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? [SEC1.2]

RETAIL PRICE = WHOLESALE PRICE + MARKUP

$550 = X + 45% X

$550 = 1X + 0.45 X

$\frac{\$550}{1.45} = \frac{1.45X}{1.45}$

X = $379.31

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?

SALES PRICE = RETAIL PRICE − DISCOUNT

$135.50 = X − 30% X

$135.50 = 1X − 0.30 X

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

$\frac{\$135.50}{0.70} = \frac{0.70X}{0.70}$

$193.57 = X

x_1 y_1 x_2 y_2

Find the slope of the line that goes through the pair of points. [SEC 1.4]

8) (2, –2) and (6, 6)

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

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

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.
B) A parabola that opens up.
C) A decreasing linear model.
D) A parabola that opens down.

10) A salesperson weekly, commision 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) $y = 2x^2 - 8x + 9$

$a = 2 \quad b = -8 \quad c = 9$

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]

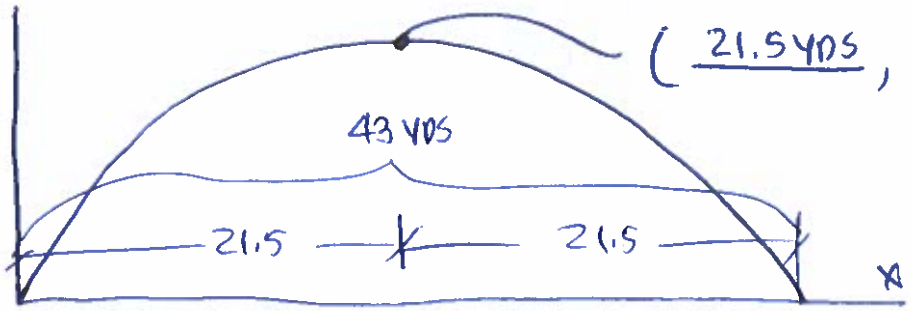
A) Linear function that decreases from left to right

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?



(21.5 YDS, 15.2 YDS)

↑ MAX. HEIGHT

X - COORDINATE: $x = -\frac{b}{2a} = \frac{-1.42}{2(-0.033)} = \frac{-1.42}{-0.066} = 21.5$

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

$y = -0.033(462.25) + 30.5$

$y = -15.3 + 30.5$

$y = 15.2$

A) About 43 yards
B) About 27 yards
C) About 21 yards
D) About 14 yards
E) About15 yards

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

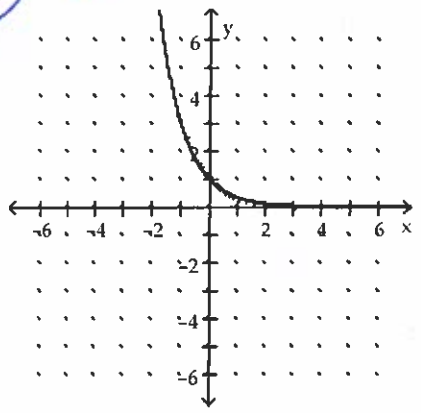
Graph the function. [SEC 1.6]

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

$y = (0.25)^x$

$b < 1$

A)



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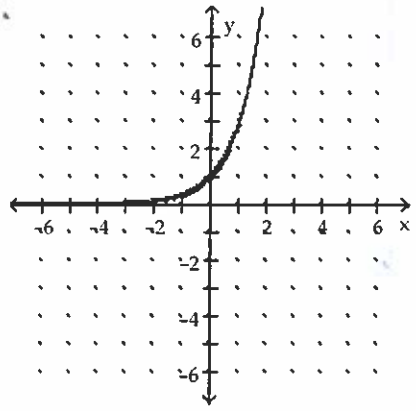

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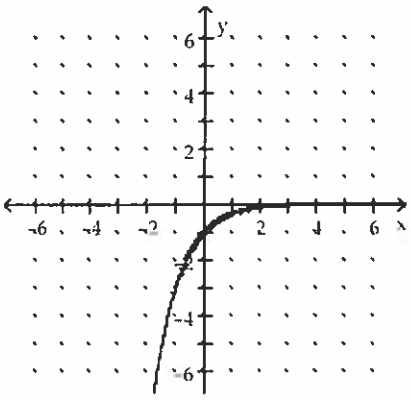

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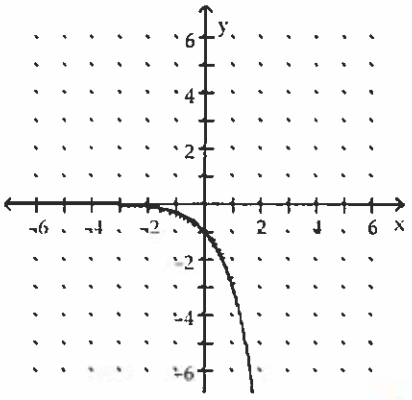


18) Since 1970, the growth in the U.S. population in millions closely fits the exponential function $P(t) = 200e^{0.018t}$, where t is the number of years since 1970. Estimate the population in the year 2020. [SEC 1.6]

$t = 2020 - 1970 = 50$

$P(t) = 200e^{0.018t}$

$P(50) = 200(2.718)^{0.018(50)}$

$P(50) = 200(2.718)^{0.9}$

$P(50) = 200(2.459)$

$= 491.8$

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]

$t = 2015 - 1996 = 19$ yrs

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

$V(19) = 2.718^{0.15(19)} + 15$

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

$= 17.28 + 15 = \$32.28$

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) 0.2397 1 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) $\log_3\left(\frac{1}{9}\right) = -2$

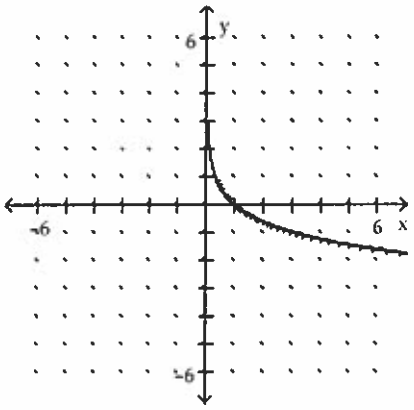
24) log (72) [SEC 1.7]

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

Graph the function. [SEC 1.6]

25) $y = e^x$ → $y = (2.718)^x$, $b > 1$

A)



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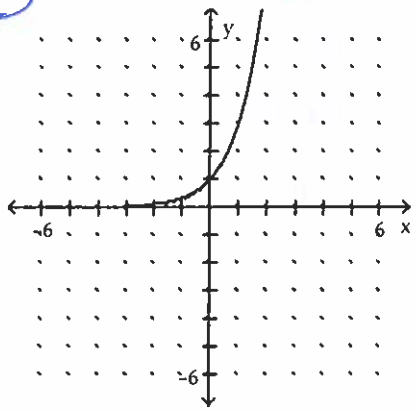

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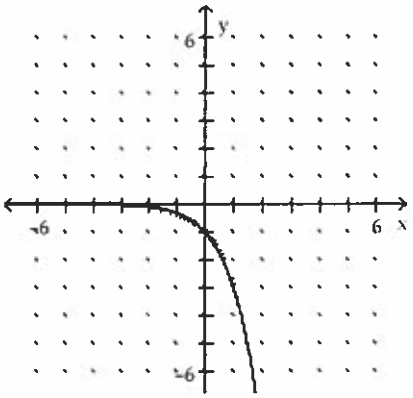
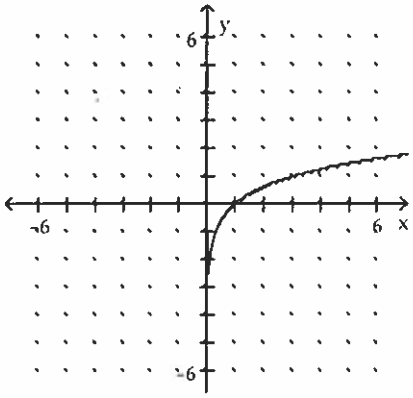


D)



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%