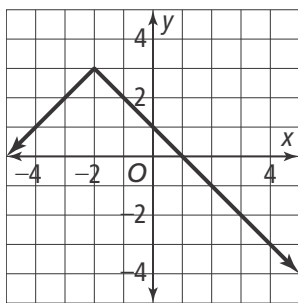


Progress Monitoring Assessment Form C

1. The graph below is translated 3 units right, and 5 units down. What is the equation of the new graph?



- Ⓐ $y = -|x + 1| - 2$
 Ⓑ $y = -|x + 1| + 2$
 Ⓒ $y = -|x - 1| - 2$
 Ⓓ $y = -|x - 1| + 2$

2. Select all functions whose graph has a vertical asymptote at $x = 4$.

- ☐ Ⓐ. $f(x) = \log_4 x - 4$
☒ Ⓑ. $f(x) = \ln(x - 4)$
☒ Ⓒ. $f(x) = \log(x - 4) + 4$
☐ Ⓓ. $f(x) = 4 \ln x - 4$
☒ Ⓔ. $f(x) = \log(x - 4)$

3. It takes Faucet A 8 hours to fill a tank, and it takes Faucet B 4 hours. If the tank is empty, how long will it take the two faucets to fill the tank together?

2

hours and

40

minutes

4. The graph of a quadratic function $f(x)$ has a vertex at $(2, -4)$. What is the vertex of $g(x)$ if $g(x) = f(x - 3) - 2$?

(5, -6)

5. The height above sea level of a pelican diving for fish is modeled by $f(x) = x^4 - 2x^3 - 29x^2 + 30x$. Select all the x -values where the pelican enters or exits the water.

- ☐ Ⓐ. -6
☒ Ⓑ. -5
☒ Ⓒ. 0
☒ Ⓓ. 1
☐ Ⓔ. 4
☒ Ⓕ. 6

6. Solve $-x^2 + 5x = 7$ over the set of complex numbers.

- Ⓐ $\frac{5 + i\sqrt{3}}{2}, \frac{5 - i\sqrt{3}}{2}$
 Ⓑ $\frac{5 + i\sqrt{53}}{2}, \frac{5 - i\sqrt{53}}{2}$
 Ⓒ $\frac{-5 + i\sqrt{53}}{2}, \frac{-5 - i\sqrt{53}}{2}$
 Ⓓ $\frac{-5 + i\sqrt{3}}{2}, \frac{-5 - i\sqrt{3}}{2}$

7. Find the exact solution to $5e^{\frac{x}{2}} = 10$.

 $x = \ln(4)$

8. Which of the following is equivalent to the expression $(i - 5)(3 + 2i)$?

- Ⓐ $-7i - 13$
 Ⓑ $13i - 17$
 Ⓒ $-7i - 17$
 Ⓓ $-13i - 17$

9. Divide $x^3 - 4x^2 + 6x - 2$ by $x - 1$. Complete the quotient using the choices provided.

$3x$	$-5x$	$-3x$	3
11	-3	$\frac{9}{x-1}$	$\frac{1}{x-1}$

$x^2 +$ $+$ $+$

10. The formula $N = S(P - V) - F$ represents net income N , where P represents sales price, V is the variable cost per unit, S is the sales volume, and F are fixed costs. Complete the formula to find the variable cost per unit.

N	S	P	V	F
-----	-----	-----	-----	-----

Formula for variable cost:

= - $\frac{\text{} + \text{}}{\text{}}$

11. The function $f(x) = \sqrt{x - 10}$ represents the profits of a company after x years in business. Which function represents the number of years as a function of the profits?
- (A) $f^{-1}(x) = (x - 10)^2$, for $x \geq 0$
- (B) $f^{-1}(x) = (x - 10)^2$, for $x \geq -10$
- (C) $f^{-1}(x) = x^2 + 10$, for $x \geq 0$
- (D) $f^{-1}(x) = x^2 + 10$, for $x \geq -10$

12. What is the average rate of change for the function $f(x) = -2x^2 + 5$ over the interval $-3.5 \leq x \leq 0$?
- (A) 19.5
- (B) 7
- (C) -7
- (D) -19.5

13. A pizza restaurant is located in a town with a population density of 1200 people per square mile. What delivery radius will allow the pizza restaurant to deliver to approximately 30,000 people?

(A) 2.8 miles

(B) 5.0 miles

(C) 1.6 miles

(D) 8.0 miles

14. Simplify.

$$\sqrt{8} + \sqrt{32} - 2^{\frac{3}{2}}$$

(A) $-2\sqrt{2} - \sqrt[3]{2}$

(B) $8\sqrt{2}$

(C) $4\sqrt{2}$

(D) 0

15. M varies inversely with x . If $M = 2$ when $x = 10$, find the value of M when $x = 5$.

$M =$

16. Solve the equation $-2 \ln(3x) = 5$.

(A) 0.082

(B) 0.027

(C) 4.061

(D) 36.547

17. Factor the expression $x^2 - 33x + 32$ to reveal the zeros of the function defined by $f(x) = x^2 - 33x + 32$.

The factored expression is

$$(x + \text{$$

The zeros of the function are

and .

18. The number of people attending a music festival has been increasing over the last several days. On Monday, 240 people attended. On Tuesday, 290 people attended. And on Friday, 440 people attended.

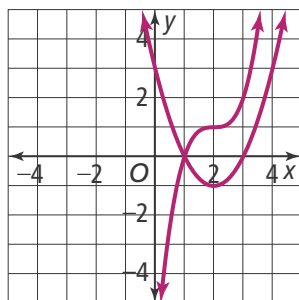
Part A Is the sequence that represents the festival attendance arithmetic? If it is, choose the recursive formula for the sequence.

- (A) No; the music festival attendance cannot be represented by an arithmetic sequence.
- (B) Yes; $a(n) = 290 + n$
- (C) Yes; $a_1 = 240$, $a_n = a_{n-1} + 50$
- (D) Yes; $a_1 = 240$, $a_n = a_{n+1} + 50$

Part B If the trend continues, how many people will attend on Saturday?

490 people

19. Use a graph to solve $(x - 2)^2 - 1 = (x - 2)^3 + 1$.



$x =$ **1**

20. What constant do you add to each side of the equation to solve by completing the square?

$$3x^2 + 4x = 5$$

- (A) $\frac{9}{16}$
- (B) $\frac{4}{3}$
- (C) $\frac{3}{2}$
- (D) 6

21. Select the solutions of the equation $x^2 = -64$.

- (A) 8
- (B) $-8i$
- (C) -8
- (D) $32i$
- (E) $8i$
- (F) $-32i$

22. Simplify $(x^2 + 4x)(x^2 + x + 2)$.

- (A) $8x^2 + 5x^3 + 8x$
- (B) $x^4 + 5x^3 + 6x^2 + 8x + 2$
- (C) $x^4 + 5x^3 + 6x^2 + 8x$
- (D) $4x^5 + 4x^4 + 8x^3$

23. Use a graph of the polynomial function $f(x) = x^3 + 3x^2$ to complete the following:

The zeros of f are **-3** and **0**.

As x decreases, $f(x)$ ☐ increases. ☒ decreases.

As x increases, $f(x)$ ☒ increases. ☐ decreases.

24. Explain each step used to solve the equation using the properties of logarithms.

Product

Quotient

Power

$$\log x + \log x^4 = 10$$

$$\log x^5 = 10$$
 Product

$$5 \log x = 10$$
 Power

$$x = 100$$

25. Solve $x^2 + 10x + 6 = 0$. Use the choices provided to complete the solution.

$x =$ \pm

26. Function f is a cosine function with period 3π , amplitude 4, and a local maximum at $f(0) = 6$. Find the equation of the midline of the graph of f .

The equation of the midline of the graph of f is $y =$.

27. A Ferris wheel has a diameter of about 175 feet. To the nearest foot, how far does a rider travel as the wheel rotates through $\frac{\pi}{3}$ radians?

feet

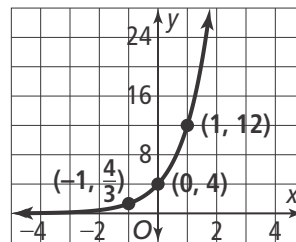
28. A high school basketball team had a season average of 42 points per game. For the first 3 games of the season, they averaged 45 points per game. Which word best describes the number 45?

☐ A variable ☐ C parameter
☐ B sample ☒ D statistic

29. Select all the statements about the graph of $y = 2\sin(x)$ that are true.

- ☒ A. The domain of the function is $(-\infty < x < \infty)$.
☐ B. The function has vertical asymptotes when $x = 1$.
☒ C. Two of the function's zeros are when $x = 0$ and $x = 2\pi$.
☒ D. The function is decreasing when $\frac{\pi}{2} < x < \frac{3\pi}{2}$.
☒ E. The period of the function is 2π .

30. Function f is graphed below.



Select all the functions with a greater growth factor than f .

- ☒ A. $a(x) = 3 \cdot 4^x$
☐ B. $b(x) = 1.25^x$
☒ C. $c(x) = \left(\frac{1}{12}\right) \cdot 12^x$
☐ D. $d(x) = 12 \cdot \left(\frac{4}{3}\right)^x$
☐ E. $e(x) = \left(\frac{9}{16}\right)^x$

31. Complete the following sentence to make a true statement about the expression $81^{\frac{1}{3}}$.

$81^{\frac{1}{3}}$ is equivalent to

☒ $\sqrt[3]{81}$
☐ 3
☐ $\sqrt{81^3}$
☐ 2

because

☐ $9 = \sqrt{81}$
☒ $(\sqrt[3]{81})^3 = 81$
☐ $9^2 = 81$
☐ $\sqrt{81^3} = 1$

32. In the expression $2x^2 + 3 + \frac{7}{y}$, x and y are positive numbers. Select all the statements which result in the value of the expression increasing.

- ☐ A. x decreasing and y increasing
- ☒ B. x increasing and y decreasing
- ☐ C. y increasing and x remaining constant
- ☒ D. y decreasing and x remaining constant
- ☐ E. x decreasing and y remaining constant
- ☒ F. x increasing and y remaining constant

33. Two community activists plan to contact local residents to urge them to vote for their preferred candidate for county sheriff.

Part A Lucía plans to contact 12 residents per day. Write a function that models the number of residents she contacts after x days.

$$f(x) = 12x$$

Caleb uses a different strategy. He contacts 4 people on the first day. Those people will then contact 4 people the next day. This pattern continues each day. Write a function that models the number of people contacted by both Lucía and Caleb after x days.

$$g(x) = 12x + 4^x$$

Part B Past experience shows that only 35% of people contacted will actually vote for their preferred candidate. Write a function that models the number of votes Lucía and Caleb can expect to gain for their candidate after x days.

$$h(x) = 0.35(12x + 4^x)$$

If Lucía and Caleb start contacting people 7 days before the election, how many additional votes does the model predict they will gain for their candidate? Round to the nearest whole number.

5,764

34. Use the equation $\frac{x^2 + 4}{x - 1} = \frac{5}{x - 1}$ to answer the questions.

Part A

Solve the equation for x .

$x =$ -1

Part B

Are there any extraneous solutions? Explain why or why not.

- (A) There are no extraneous solutions because all solutions are real numbers.
- (B) $x = 1$ is an extraneous solution because it makes a denominator equal to 0.
- (C) $x = -1$ is an extraneous solution because it makes a denominator equal to 0.
- (D) $x = 0$ is an extraneous solution because zero can not be a solution.

35. Where will the discontinuities occur in the graph of the rational function?

$$f(x) = \frac{x^2 + 5x}{x^2 - 2x - 35}$$

- (A) at $x = -5$ (B) at $x = 7$
- (C) at $x = 0$, $x = -5$ and $x = 7$
- (D) at $x = -5$ and $x = 7$

36. Milianna rolls a number cube and will win a game with an outcome of an odd number or 6. Complete the statement.

The winning outcomes are the

<input type="checkbox"/> union	of {1, 2, 3, 5, 6}
<input checked="" type="checkbox"/> intersection	
<input type="checkbox"/> complement	
<input type="checkbox"/> event	

and {1, 3, 4, 5, 6}.

Use the data in Items 37 and 38.

The data show the favorite music of a random sample of students.

	Rock	Hip-Hop	Heavy Metal
10 th Grade	16	12	4
11 th Grade	18	10	12
12 th Grade	16	8	6

37. What is the probability that a randomly selected 12th grade student at the school favors heavy metal?

20 %

38. Complete the following to make a true statement.

The probability of randomly selecting a 10th grade student given the student chose rock is

<input checked="" type="checkbox"/> greater than	selecting a
<input type="checkbox"/> less than	
<input type="checkbox"/> equal to	

student who chose rock given the student is in 10th grade.