Algebra 2 Test Nav Questions Name _____

1. **Directions: Drag the expressions to the correct boxes.**

Assuming the denominator does not equal zero, completely simplify the following expression.

$$\frac{-2d^2+d+15}{9-d^2} \div \frac{4d+1}{2d^2+11d+15}$$

Simplified Expression

$$\frac{\square}{\square}$$

(-1)	$(3+d)$	$(2d+5)^2$	$(3-d)$	$(9-d^2)$	$(4d+1)$	(d^2+9)	(2)	$(2d-5)^2$

2. **Which expression is equivalent to the one shown if the denominators do not equal zero?**

$$\frac{2x}{x^2-49} - \frac{3}{(x-4)(x-7)}$$

○ A. $\frac{2x^2-11x-21}{(x-4)(x+7)}$

○ B. $\frac{2x^2-11x+21}{(x-4)(x-7)}$

○ C. $\frac{2x+3}{(x-4)(x+7)}$

○ D. $\frac{2x+3}{x-4}$

3. **Which expression is equivalent to the one shown if no denominators equal zero?**

$$\frac{\frac{-13+d}{42d^3}}{\frac{13-d}{6d^9}}$$

○ A. $-\frac{7}{d^3}$

○ B. $-\frac{d^3}{7}$

○ C. $\frac{7}{d^6}$

○ D. $-\frac{d^6}{7}$

4. **Directions: Select the correct answers.**

Identify two expressions that are equivalent to $\sqrt[6]{729q^{17}r^{11}}$.

$\frac{729}{6}q^{\frac{17}{6}}r^{\frac{11}{6}}$	$\frac{729}{6}q^{11}r^5$	$3q^{\frac{17}{6}}r^{\frac{11}{6}}$	$3q^{11}r^5$
$\frac{729}{6}q^{\frac{6}{17}}r^{\frac{11}{17}}$	$\frac{729}{6}q^2r\sqrt[6]{q^5r^5}$	$3q^{\frac{6}{17}}r^{\frac{6}{11}}$	$3q^2r\sqrt[6]{q^5r^5}$

5. **Which expression is equivalent to $\sqrt[3]{576n^8p^{27}}$?**

A. $4n^2p^9\sqrt[3]{9n^2}$

B. $4n^2p^3\sqrt[3]{9}$

C. $24n^4p^{13}\sqrt[3]{p}$

D. $192n^2p^9\sqrt[3]{n^2}$

6. **Which is the factored form of $125m^3 - 343$?**

A. $(5m-7)^3$

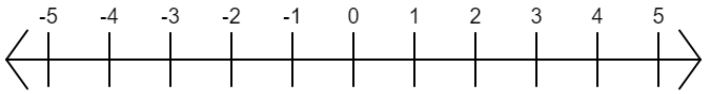
B. $(5m-7)(25m^2+35m+49)$

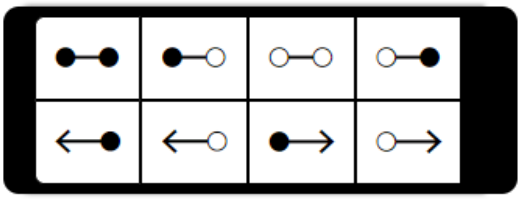
C. $(5m-7)(25m^2+70m+49)$

D. $(5m-7)(25m^2-35m-49)$

7. **Directions: Select a segment or ray. Then drag the endpoint to the correct location on the number line.**

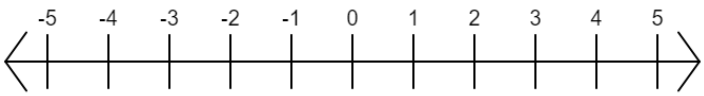
Plot the solution to the inequality $|x-2|>2$.

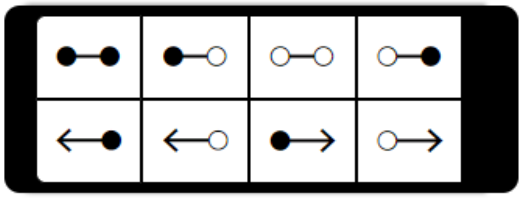




8. **Directions: Select a segment or ray. Then drag the endpoint to the correct location on the number line.**

Plot the solution to the inequality $-3|x-2|+1<-5$.

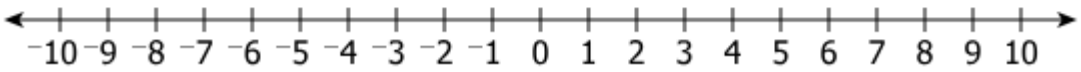




9. **Directions: Select all the correct answers.**

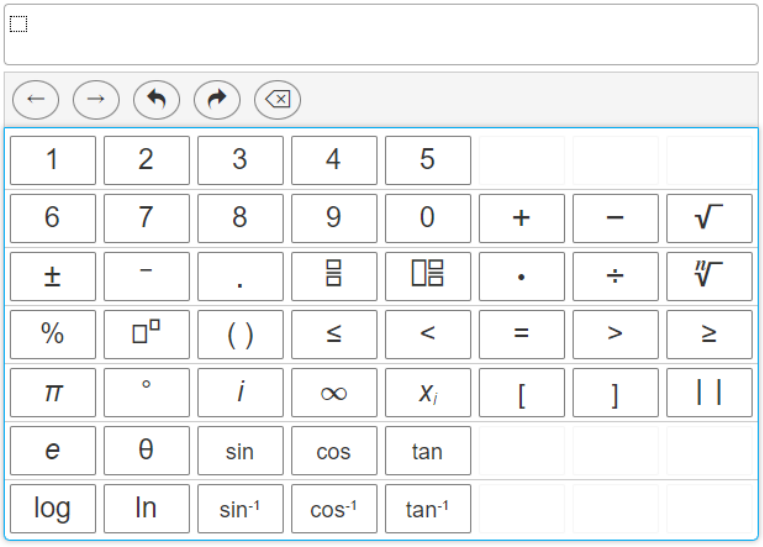
Graph the solutions to

$$\left|\frac{1}{8}x-\frac{1}{4}\right|=\frac{1}{2}.$$



10. **Directions: Enter your answer in the space provided. Use the numbers and symbols to enter your answer.**

One solution to a quadratic equation is $^{-}16 - 8i\sqrt{35}$. Create an expression to represent the other solution.



11. **What is the solution set for this equation?**

$$3\sqrt{2x-4}+6=3$$

- A. $\left\{\frac{5}{2}\right\}$
- B. $\left\{\frac{1}{2}\right\}$
- C. $\left\{-\frac{1}{2}\right\}$
- D. $\{\ \}$

12. **What are the y-coordinates for the solutions to this system of equations?**

$$\begin{cases} x^2+6x+3y+6=0 \\ x+y+20=0 \end{cases}$$

- A. $y = {}^{-}9$ and $y = 6$
- B. $y = {}^{-}20$ and $y = {}^{-}2$
- C. $y = {}^{-}26$ and $y = {}^{-}11$
- D. $y = {}^{-}27$ and $y = {}^{-}18$

13. **Directions: Select all the correct answers.**

Identify the x-coordinate of each point that is in the solution set of the system of equations.

$$\begin{cases} 5x - 4y - 11 = 0 \\ y = x^2 - x - 6 \end{cases}$$

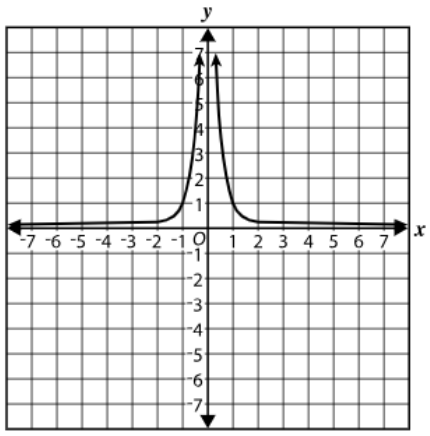
−0.25	−1	−2	−3.25	−13
0.25	1	2	3.25	13

14. **What is the value of this summation?** $\sum_{n=1}^{\infty} \left(\frac{2}{3}\right)^n$

○ A. 0 ○ B. 1 ○ C. 2 ○ D. 3

15. **Directions: Select all the correct answers.**

The graph of a parent function is shown.

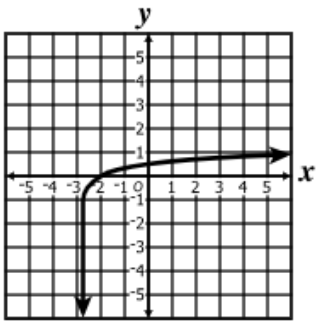


Identify each function which belongs to this same family.

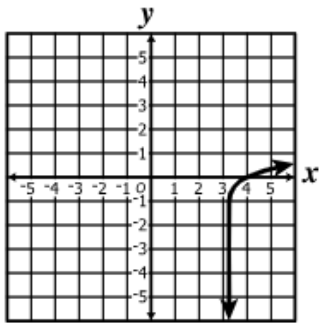
$f(x) = \frac{-3}{x^2}$	$f(x) = \frac{3}{x}$	$f(x) = \frac{3}{(x+1)^2}$	$f(x) = \frac{-3}{x+1}$

16. **Which graph could represent a function $g(x) = \log(x) + c$ where $c < 0$?**

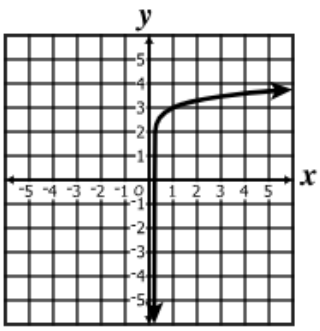
Graph A



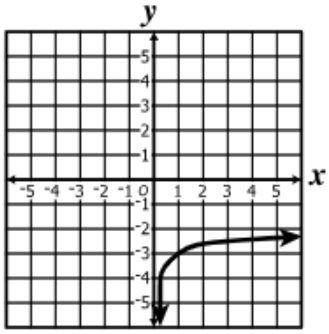
Graph B



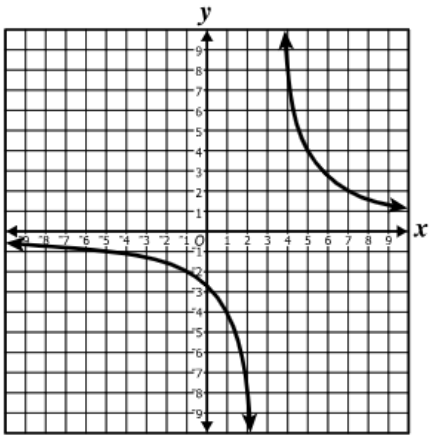
Graph C



Graph D



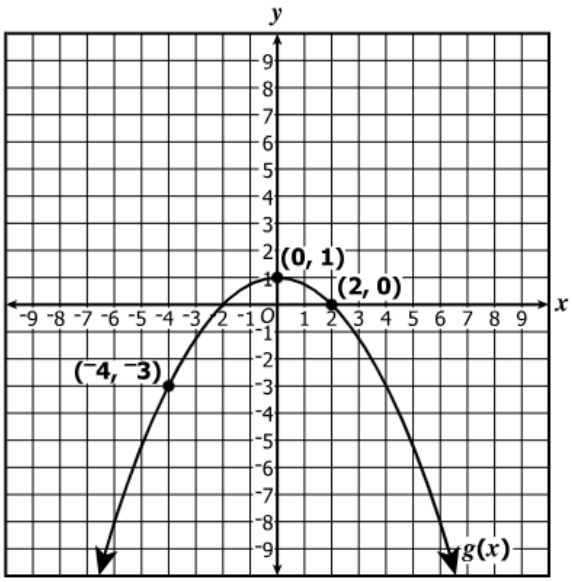
17. **Which function is best represented by this graph?**



- A. $f(x) = \dfrac{8}{x+3}$
- B. $f(x) = \dfrac{8}{x-3}$
- C. $f(x) = \dfrac{x+1}{x+3}$
- D. $f(x) = \dfrac{x+1}{x-3}$

18. **Directions: Select the correct answers.**

The function $f(x) = x^2$ is transformed to create $g(x)$ as shown in the graph.



Determine which transformations to $f(x)$ produced $g(x)$.

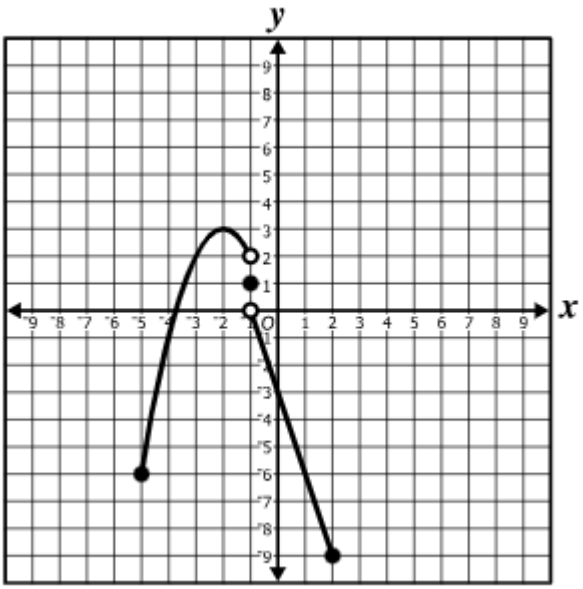
First, $f(x)$ was [Choose...] .

- Choose...
- reflected over the x-axis
- reflected over the y-axis

The result was then [Choose...]

- Choose...
- horizontally compressed by a factor of 0.25, translated up 1 unit
- horizontally stretched by a factor of 2, translated up 1 unit
- vertically compressed by a factor of 0.5, translated up 1 unit
- vertically stretched by a factor of 4, translated up 1 unit

19. **The graph of a function is shown on the grid.**
What appears to be the domain of this function?



- A. $\{x | {}^-9 \le x \le 3\}$
- B. $\{x | {}^-5 \le x \le 2\}$
- C. $\{x | {}^-5 \le x \le {}^-1 \text{ and } {}^-1 < x < 2\}$
- D. $\{x | {}^-9 \le x \le 0 \text{ and } 2 < x \le 3\}$

20. **Directions: Type your answer in the box.**

Given: $xy + y - x = 7$

Determine the value of x that is NOT in the domain of this function.

$x =$ ☐

21. **Directions: Select the correct answers.**

Identify two functions with the same range as $f(x) = |x| - 4$.

- $g(x) = x^2 + 2x - 3$
- $h(x) = x^3 - 4$
- $j(x) = 2^x - 5$
- $k(x) = \sqrt{x} - 4$
- $m(x) = (x - 4)^2$

22. **Directions: Drag the correct answer to the box.**

Complete the equation to create a continuous function.

$$g(x) = \frac{x^2}{\square}$$

$(x + 13)(x - 15)$	$(x + 2)^2 + 13$	x	$x^2 - 2x - 4$

23. **Directions: Select all the correct answers.**

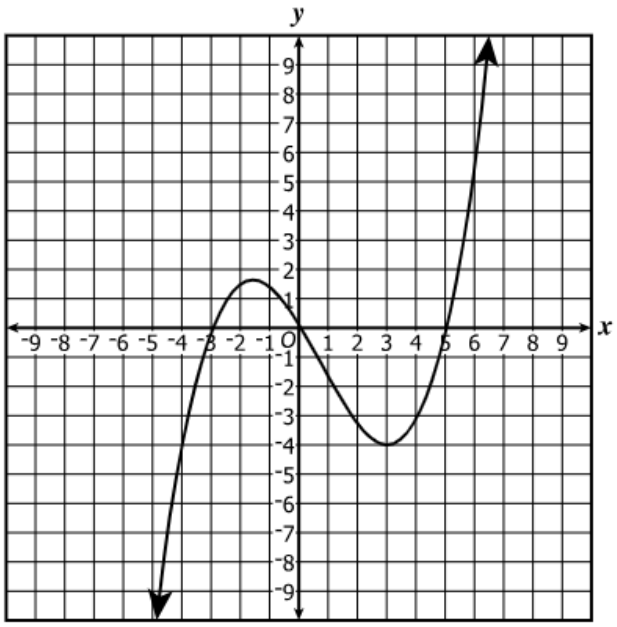
Indicate the intervals where the graph of $f(x) = 2x^3 - 3x^2 - 12x + 20$ is only increasing throughout the interval.

- $-\infty < x < \infty$
- $-\infty < x < -1$
- $-2.5 < x < \infty$
- $-1 < x < 2$
- $0 < x < \infty$
- $2 < x < \infty$

24. **Directions: Type your answer in the box.**

The graph of f is shown.

$$f(x) = \frac{x(x+3)(x-5)}{9}$$



What is the value of the apparent relative minimum in the interval $(^-3, 6)$?

25. **Throughout which interval is $f(x) = {}^-x^3 + 2x^2 + 4x - 2$ increasing?**

- A. $(^-\infty, {}^-3]$
- B. $[^-3, 0]$
- C. $[0, 2)$
- D. $(2, \infty)$

26. **Directions: Type your answer in the box.**

What is the zero of $g(x) = 9^x - 243$?

27. **The graph of**

$$g(x) = \frac{x+1}{x}$$

has —

- A. two x-intercepts and no y-intercept
- B. two x-intercepts and one y-intercept
- C. one x-intercept and no y-intercept
- D. one x-intercept and one y-intercept

28. **Which of the following describes the end behavior of**

$$h(x) = \frac{x-6}{x^2}$$

as x approaches negative infinity?

- A. y approaches negative infinity
- B. y approaches $^{-}6$
- C. y approaches $^{-}1$
- D. y approaches 0

29. **Which of the following describes the end behavior of** $f(x) = 9\log\left(\frac{2}{5}x\right) + 5$ **as x approaches 0 ?**

- A. $f(x)$ approaches $^{-}\infty$
- B. $f(x)$ approaches 0
- C. $f(x)$ approaches 5
- D. $f(x)$ approaches ∞

30. **Directions: Drag the correct answers to the boxes.**

Identify the equation of the horizontal asymptote and the equation of the vertical asymptote of

$$g(x) = \frac{4x+1}{x-3}.$$

Horizontal Asymptote	Vertical Asymptote

$x = 0$ | $x = \frac{1}{4}$ | $x = 3$ | $y = \frac{^{-}1}{3}$ | $y = 0$ | $y = 4$

31. **Directions: Enter your answer in the space provided. Use the numbers and symbols to enter your answer.**

What is the inverse of $g(x) = x^3 - 8$?

$g^{-1}(x) = \square$

1	2	3	4	5	x	g	
6	7	8	9	0	+	−	√
±	⁻	.			·	÷	
%		( )	≤	<	=	>	≥
π	°				[	]	| |

32. Let $g(x) = 2x^2 - 5$ and $h(x) = \frac{x}{3} - 7$.

What is $g(h(12))$?

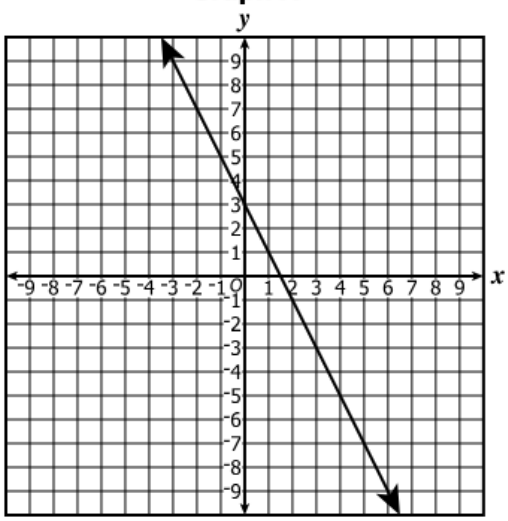
33. Given: $f(x) = x - 1$

$g(x) = {}^{-}2x + 4$

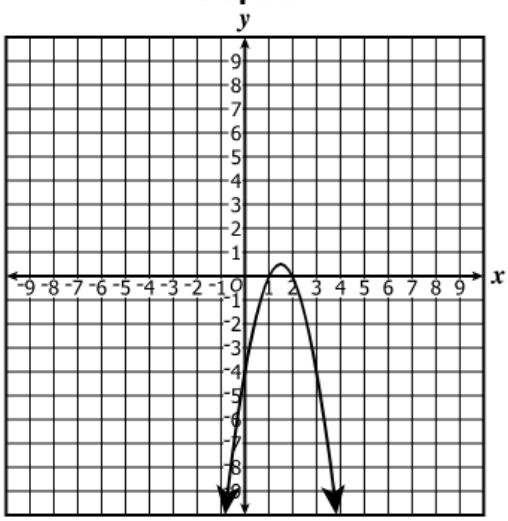
Which graph best represents $f(g(x))$?

- A. Graph A
- B. Graph B
- C. Graph C
- D. Graph D

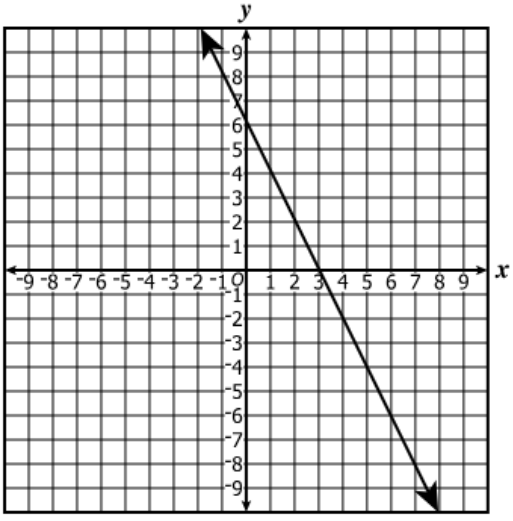
Graph A



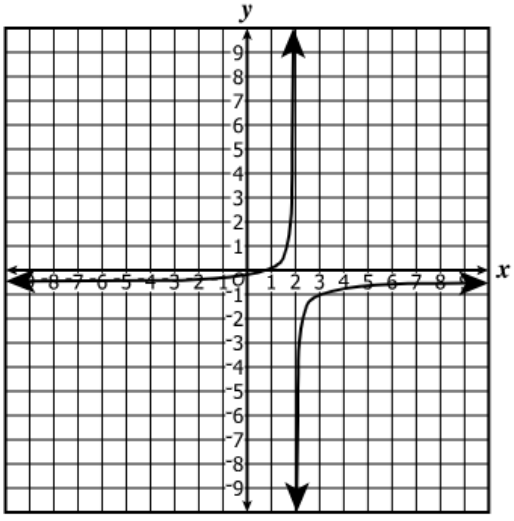
Graph B



Graph C



Graph D



34. **Directions: Select all the correct answers.**

The zeros of a cubic function $f(x)$ are -1, $-\frac{2}{3}$, and 5. Select all of the factors of $f(x)$.

$(x-1)$	$(3x+2)$	$(x+5)$
$(x+1)$	$(3x-2)$	$(x-5)$

35. **The amount of lost revenue from tickets not sold for a concert is shown in the table. The ticket prices include tax.**

Which equation best models the relationship between y, the amount of lost revenue, and x, the price per ticket?

- A. $y = 1{,}218(1.01)^x$
- B. $y = 997(1.03)^x$
- C. $y = 400x - 11{,}570$
- D. $y = 156x - 10{,}000$

Lost Revenue From Tickets Not Sold

Price per Ticket (x)	$25	$35	$55	$125
Number of Tickets Not Sold	84	80	92	323
Amount of Lost Revenue (y)	$2,100	$2,800	$5,060	$40,325

36. **Directions: Type your answer in the box.**

The volume of a container varies jointly with the square of its radius, r, and its height, h. The container has a height of 10 centimeters, a radius of 6 centimeters, and a volume of 377 cubic centimeters. What is the volume of a container with a radius of 4 centimeters and a height of 4 centimeters? Your answer must be rounded to the nearest whole number.

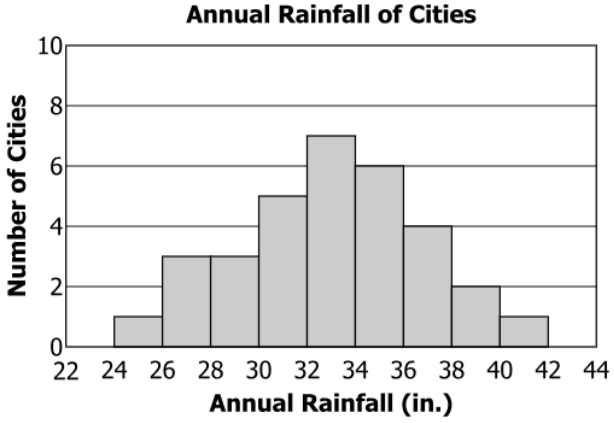
[ ] cm^3

37. **Directions: Select all the correct bars on the histogram.**

The normally distributed data on the annual rainfall for 32 cities are summarized in this histogram.

- **The mean amount of rainfall for these cities is 32.5 inches.**
- **The standard deviation of the data is 4 inches.**

On the histogram, identify each interval that may have data points within 1.5 standard deviations of the mean.



38. **Directions: Type your answer in the box.**

The heights of 200 kindergarten students at T. E. Wright Elementary are normally distributed with a mean of 40 inches and a standard deviation of 1.8 inches. Approximately how many students have a height between 37.3 inches and 44.5 inches? Your answer must be in the form of a whole number.

[ ] Students

39. **A normally distributed set of 968 values has a mean of 108 and a standard deviation of 11. Which is closest to the number of values expected to be above 125 ?**

- A. 910
- B. 789
- C. 210
- D. 59

40. **This table shows data on the amount of money raised during a fundraiser for four different classes and for one student in each class. The data is normally distributed.**

Which of the four students raised the greatest amount of money?

- A. Jill
- B. Kelli
- C. Monroe
- D. Tim

Amount of Money Raised

	Mean for Class	Standard Deviation for Class	Student's z-Score
Jill	60	11	1.8
Kelli	58	12	2.1
Monroe	55	13	1.4
Tim	57	10	2.5

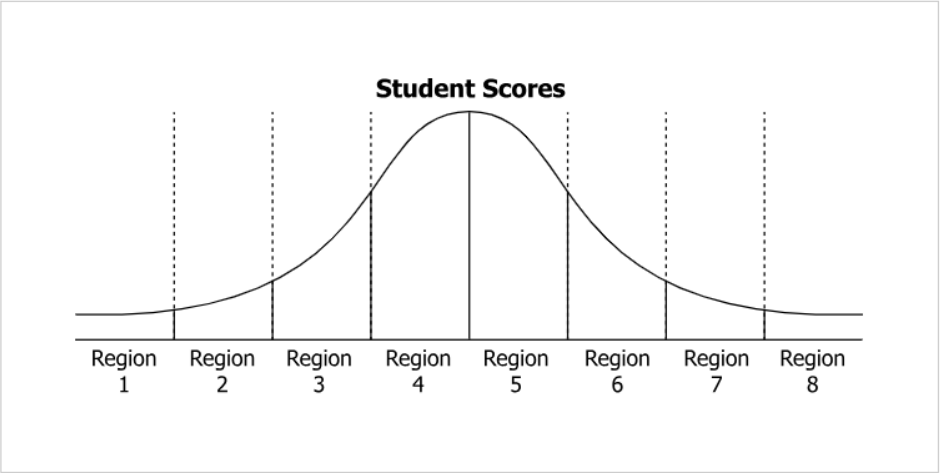
41. **Directions: Type your answer in the box.**

A data set is normally distributed with a mean of 68.42 and a standard deviation of 7.91. An element in this set is 57.

What is the z-score for 57 ? Round the answer to the nearest hundredth. Your answer must be in decimal form.

z-score = [ ]

42. **Directions: Select the correct answers.**



This graph summarizes the test scores of 50,000 students. The data is normally distributed with a mean of 81 and a standard deviation of 2.5. Identify the regions under the curve where only the data for approximately 23,750 students are located.

Region 1	Region 2	Region 3	Region 4
Region 5	Region 6	Region 7	Region 8

43. **Directions: Type your answer in the box.**

A store owner employs a total of 3 cashiers and 7 clerks. The owner plans to select a committee of 1 cashier and 2 clerks. What is the number of different committees the owner could choose? Your answer must be a whole number.

44. **Directions: Type your answer in the box.**

A family reunion planning committee with 8 members plans to elect 3 officers– a president, treasurer, and historian. If each office is to be held by one person and no person can hold more than one office, in how many ways can those offices be filled?