

5 Packet

Performance

FLQE.4,

FT.3

Performance

FT.3

16

Performance

AAPR.3

36

Performance

FT.3

Day 5

Problems #17-20

Functions Performance

Task Part A

PC.FLQE.4, PC.AAPR.3

Day 10

Problems #37-40

Functions Performance

Task Part B

PC.FT.3, PC.AAPR.3

Pre-Calculus

School Closing Work Packet

Attached you will find 80 practice questions and a function project. For each day that school is closed, you are required to complete 4 problems. Each week you will complete one part of the project.

1. Which expression is equivalent to: $2(3x - 4) + 9x + 7$?

- A. $15x + 3$ B. $15x - 1$ C. $12x + 3$ D. $24x + 6$

Mathematical Calculation Example:

$$2(3x - 4) + 9x + 7$$

$$6x - 8 + 9x + 7$$

$$15x - 1$$

B is the answer.

2. Which of the following is a linear function?

- A. $v = 15xv + 3$ B. $15x + v^2 = -1$ C. $v = 12x^2 + 3$ D. $24x + 6$

Explaining the correct answer choice

3. Which of the following is not a rational number?

- A. 15 B. $\sqrt{3}$ C. $\frac{12}{13}$ D. $4.\bar{3}$

If you have questions, please contact your teacher by email.

Functions Performance Task

Roller Coaster Crew

John and Michelle have summer internships at an engineering firm. As part of their internship, they get to

assist in the planning of a new and very thrilling roller coaster. For this assignment, you help John and Michelle as they tackle the math behind some simple curves in the coaster's track.

Part A

Functions Performance Task

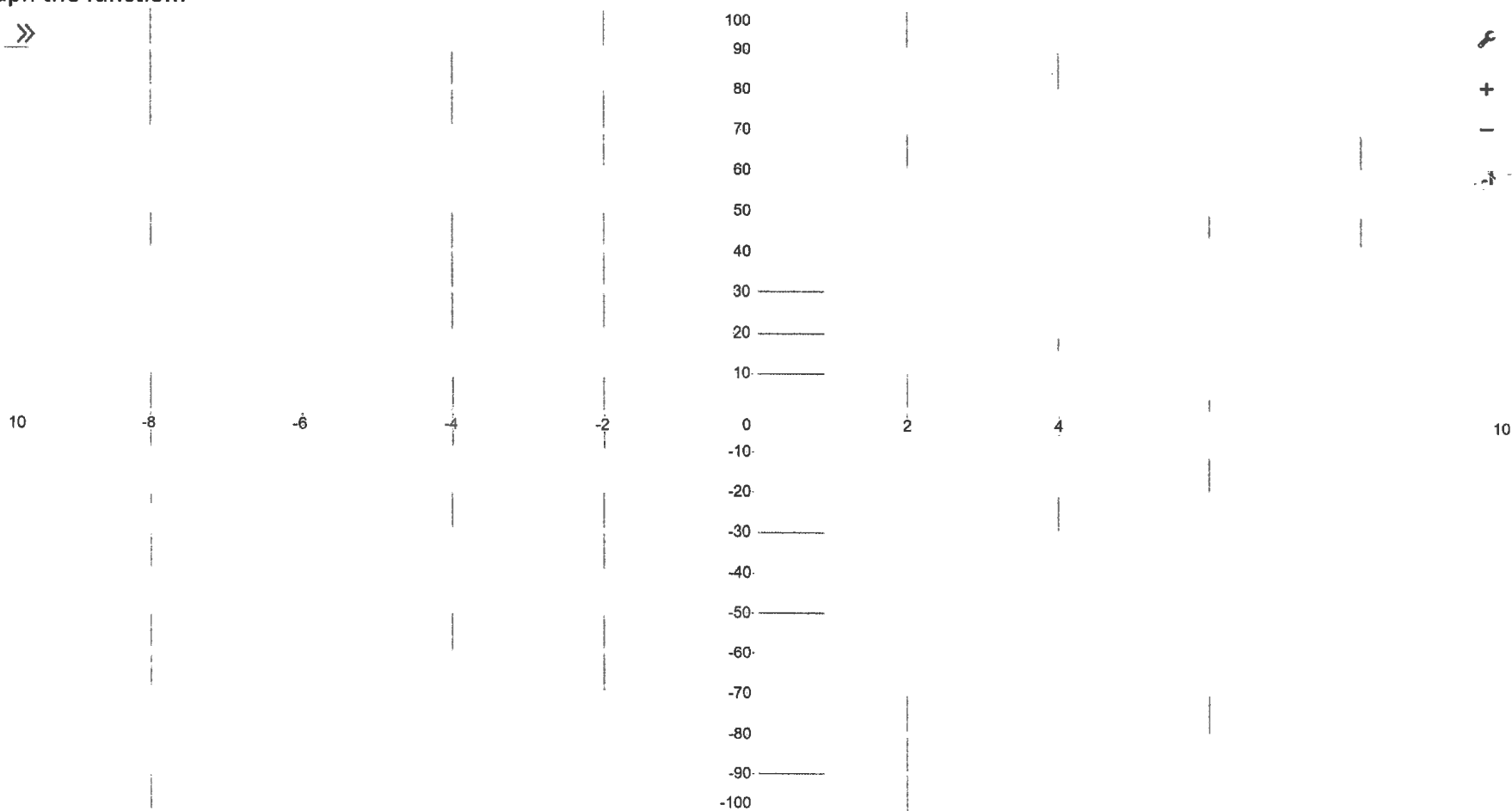
Part A

1. Identify the function you will use: $g(x) =$

- What type of polynomial function is this?
- What is the domain?
- What is the range? ___
- Describe the end behavior:
- Describe the intervals of increase
- Describe the intervals of decrease
- What are the turning points? Are they relative maximums or relative minimums?
- What are the zeros of the function?

2. Graph the function:

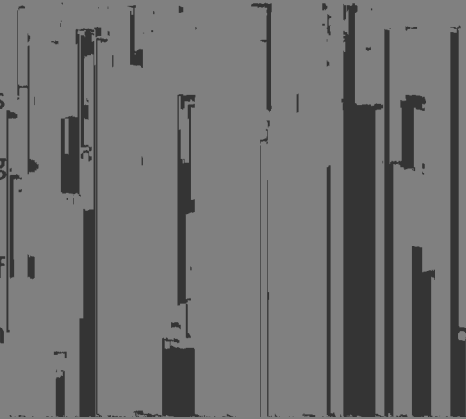
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 polynomial function is this?
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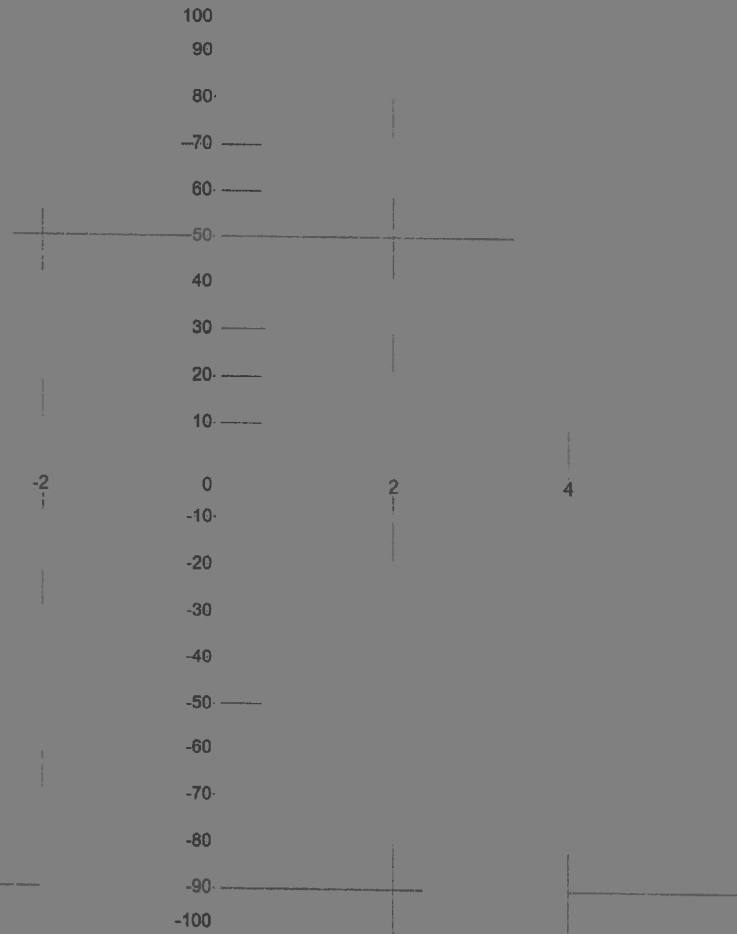
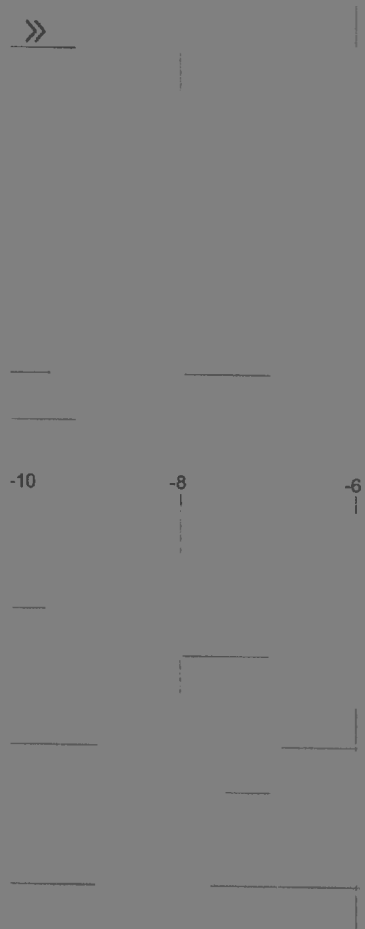
Part B

- Describe the intervals
- What are the turning relative minimums?
- What are the zeros of
- What is the equation



hey relative maximums or
 of symmetry?

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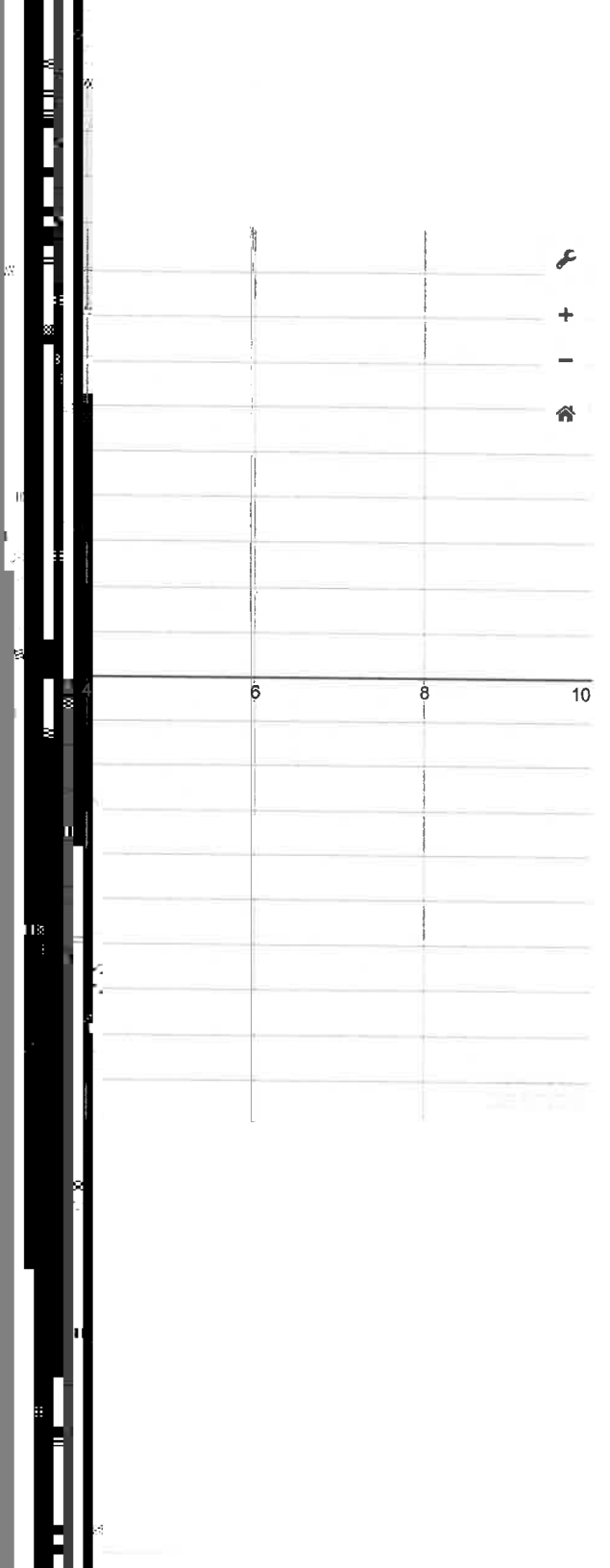
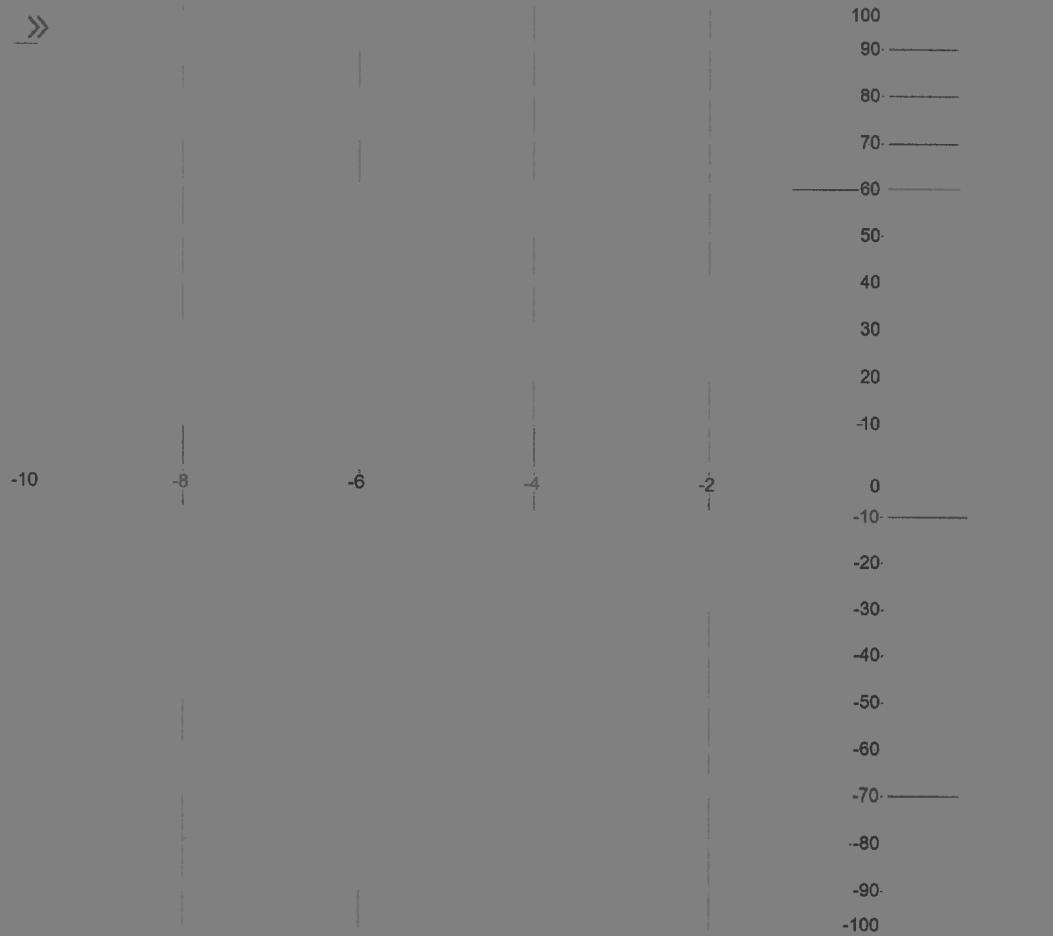


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Part C

1. Graph the entire Roller Coaster. Make sure to label all intercepts & critical points.

2.



Pre-Calculus School Closing Packet

Name: _____

Date: _____

1. Which graph represents a one-to-one function?

A.

y

x

B.

y

x

C.

y

x

D.

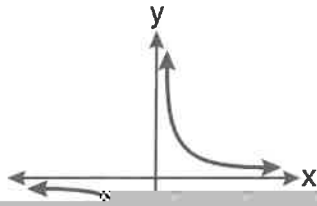
y

x

1. Which graph represents a relation that is not a

2. If $f(x) = 2x - 4$ and $g(x) = -2$, find the value of

A.



B.

y

x

C.

y



x

D.

y



x

4. If $f(x) = 3x$ and $g(x) = 7x - 1$, what is $(f \circ g)(4)$?

5. If $f(x) = 2x + 4$ and $g(x) = x^2 + 1$, find $(f \circ g)(3)$.

6. If f and g are two functions defined by $f(x) = 3x + 5$ and $g(x) = x^2 + 1$, then $g(f(x))$ is

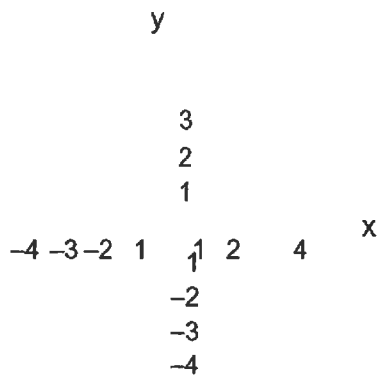
A. $x^2 + 3x + 6$

B. $9x^2 + 30x + 26$

C. $3x^2 + 8$

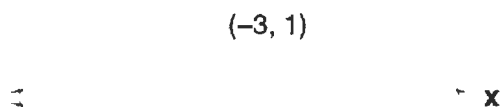
D. $9x^2 + 26$

7. Which is an equation of the parabola shown in the accompanying diagram?



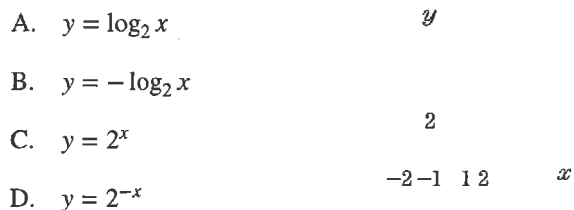
- A. $y = -x^2 + 2x + 3$ B. $y = -x^2 - 2x + 3$
 C. $y = x^2 + 2x + 3$ D. $y = x^2 - 2x + 3$

8. Which equation represents the parabola shown in the accompanying graph?



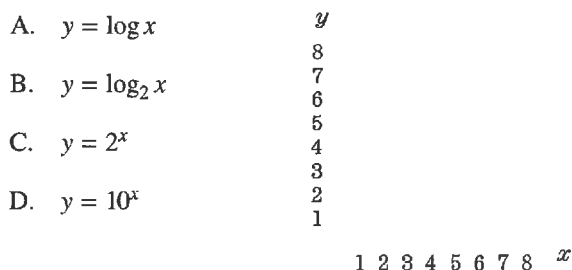
- A. $f(x) = (x + 1)^2 - 3$
 B. $f(x) = -(x - 3)^2 + 1$
 C. $f(x) = -(x + 3)^2 + 1$
 D. $f(x) = -(x - 3)^2 - 3$

9. Which is the equation of the graph below?



- A. $y = \log_2 x$
 B. $y = -\log_2 x$
 C. $y = 2^x$
 D. $y = 2^{-x}$

10. Which equation is represented by the graph in the accompanying diagram?



- A. $y = \log x$
 B. $y = \log_2 x$
 C. $y = 2^x$
 D. $y = 10^x$

11. Which equation models the data in the accompanying table?

Time in hours, x	0	1	2	3	4	5	6
Population, y	5	10	20	40	80	160	320

- A. $y = 2x + 5$ B. $y = 2^x$
 C. $y = 2x$ D. $y = 5(2^x)$

12. The height, $f(x)$, of a bouncing ball after x bounces is represented by $f(x) = 80(0.5)^x$. How many times higher is the first bounce than the fourth bounce?

- A. 8 B. 2 C. 16 D. 4

14. Which statement about the graph of the equation $y = e^x$ is *not* true?

- A. It is asymptotic to the x-axis.
 B. The domain is the set of all real numbers.
 C. It lies in Quadrants I and II.
 D. It passes through the point $(e, 1)$.

13. Which equation is represented by the accompanying graph?

y

x

A. $y = 2^x$

B. $y = -2^x$

~~C. $y = 2^{-x}$~~

D. $y = x^2 - 2$

15. Solve for the positive value of x : $\log_x 9 = 2$

16. If $\log_9 x = \frac{3}{2}$, what is the value of x ?

- A. $\frac{3}{2}$ B. 8 C. $\frac{27}{2}$ D. 27

17. If $\log 28 = \log 4 + \log x$, what is the value of x ?

- A. 7 B. 14 C. 24 D. 32

18. In the equation $\log_4 4 + \log_9 9 = 2$, x is equal to

- A. $\sqrt{13}$ B. 6 C. 6.5 D. 18

19. Solve for x : $\log_2(x+1) = 3$

20. If $r = \sqrt[3]{\frac{A^2B}{C}}$, then $\log r$ can be represented by

A. $\frac{1}{6} \log A + \frac{1}{3} \log B - \log C$

B. $3(\log A^2 + \log B - \log C)$

C. $\frac{1}{3} \log(A^2 + B) - C$

D. $\frac{2}{3} \log A + \frac{1}{3} \log B - \frac{1}{3} \log C$

21. In the accompanying diagram of right triangle RUN , $m\angle U = 90$, $m\angle N = 37$, and $RN = 21$.

R

21

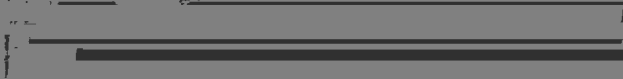
U

N

What is the length of \overline{RU} , expressed to the *nearest tenth*?

- A. 12.6 B. 15.8 C. 16.8 D. 34.9

22. In the diagram of $\triangle ABC$ shown below, $BC = 10$



C

A

To the *nearest tenth of a degree*, what is the measure of the largest acute angle in the triangle?

23. A tree casts a 25-foot shadow on a sunny day, as shown in the diagram below.

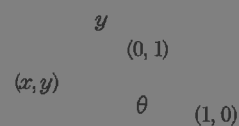
If the angle of elevation from the tip of the shadow to the top of the tree is 32° , what is the height of the tree to the *nearest tenth of a foot*?

- A. 13.2 B. 15.6 C. 21.2 D. 40.0

24. In the accompanying diagram of a unit circle, the ordered pair (x, y) represents the point where the terminal side of θ intersects the unit circle. If $m\angle\theta = 120$, what is the value of x in simplest form?

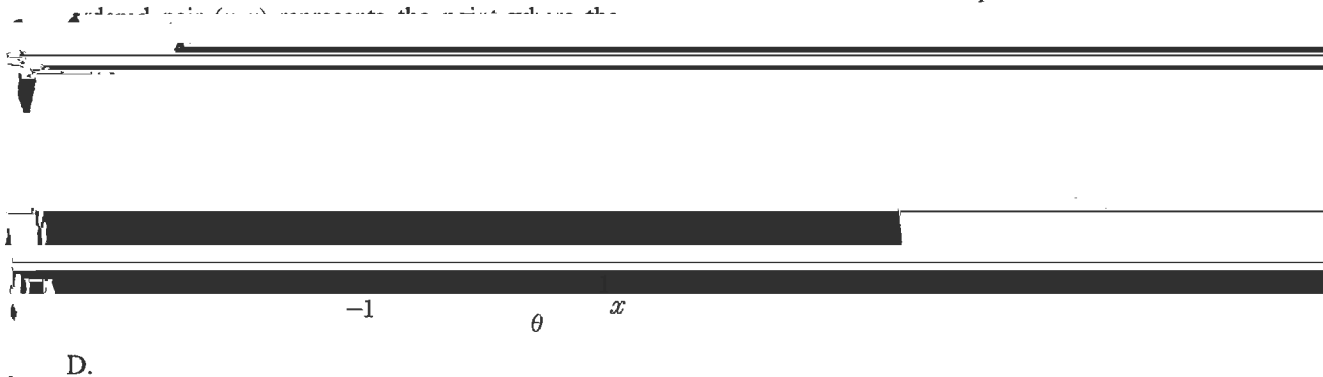
A. $-\frac{\sqrt{3}}{2}$ B. $\frac{\sqrt{3}}{2}$

C. $-\frac{1}{2}$ D. $\frac{1}{2}$



25. In the accompanying diagram of a unit circle, the

29. What is 235° , expressed in radian measure?



D.

26. If θ is an angle in standard position and its

30. What is the radian measure of an angle whose measure is -420° ?

- A. $-\frac{7\pi}{3}$ B. $-\frac{7\pi}{6}$ C. $\frac{7\pi}{6}$ D. $\frac{7\pi}{3}$

31. Which expression is equivalent to $\sin 200^\circ$?

- A. $-\sin 20^\circ$ B. $\cos 20^\circ$
C. $\cos 70^\circ$ D. $-\sin 70^\circ$

27. Expressed in degrees, $\frac{8\pi}{3}$ is equivalent to

- A. 240° B. 300° C. 420° D. 480°

32. Which expression is equivalent to $\cos 150^\circ$?

- A. $\cos 60^\circ$ B. $-\cos 60^\circ$
C. $\cos 30^\circ$ D. $-\cos 30^\circ$

28. The number of degrees equal to $\frac{4}{9}\pi$ radians is

- A. 60 B. 80 C. 130 D. 270

A. 1 B. $\sin \theta$ C. $\cos \theta$ D. $\tan \theta$

34. The expression $\cos 40^\circ \cos 10^\circ + \sin 40^\circ \sin 10^\circ$ is equivalent to

- A. $\cos 30^\circ$ B. $\cos 50^\circ$
C. $\sin 30^\circ$ D. $\sin 50^\circ$

38. The expression $\frac{1 - \sin^2 A}{2 \cos A}$ is equivalent to

- A. $\frac{\sin A}{2}$ B. $\frac{\cos A}{2}$
C. $\cos \frac{1}{2}A$ D. $2 \cos A$

35. The expression $(\cot \theta)(\sec \theta)$ is equivalent to

- A. $\tan \theta$ B. $\cos \theta$ C. $\cot \theta$ D. $\csc \theta$

39. The expression $\cos \theta(\sec \theta - \cos \theta)$ is equivalent to

- A. 1 B. $\sin \theta$
C. $\cos^2 \theta$ D. $-\cos^2 \theta$

36. The expression $\frac{\tan \theta}{\sec \theta}$ is equivalent to

- A. $\sin \theta$ B. $\frac{\sin \theta}{\cos^2 \theta}$
C. $\frac{\cos^2 \theta}{\sin \theta}$ D. $\cos \theta$

40. The expression $(1 - \cos x)(1 + \cos x)$ is equivalent to

- A. $\sin x$ B. $-\sin x$
C. $\sin^2 x$ D. $-\sin^2 x$