

3 Packet

8-12
Performance

PC.FIF.4,

8-32
Performance

PC.AAPR.3

8-16
Performance

PC.AAPR.3

8-36
Performance

PC.AAPR.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
A2.AREI.2, PC.AAPR.3

Functions Performance Task

Roller Coaster Crew

Jim and Michelle have summer internships at an engineering firm. As part of their internship, they get to assist in the planning of a brand new roller coaster. For this assignment, you help Jim and Michelle as they tackle the math behind some simple curves in the coaster's track.

Part A

The first part of Jim and Michelle's roller coaster is a curved pattern that can be represented by a polynomial function.

1. Michelle has a list of possible functions. Pick **one** of the $g(x)$ functions below and then describe to Michelle the key features of $g(x)$, including the end behavior, y-intercept, and zeros.

- a. $g(x) = x^3 - x^2 - 4x + 4$
- b. $g(x) = x^3 + 2x^2 - 9x - 18$
- c. $g(x) = x^3 - 3x^2 - 4x + 12$
- d. $g(x) = x^3 + 2x^2 - 25x - 50$
- e. $g(x) = 2x^3 + 14x^2 - 2x - 14$

Functions Performance Task

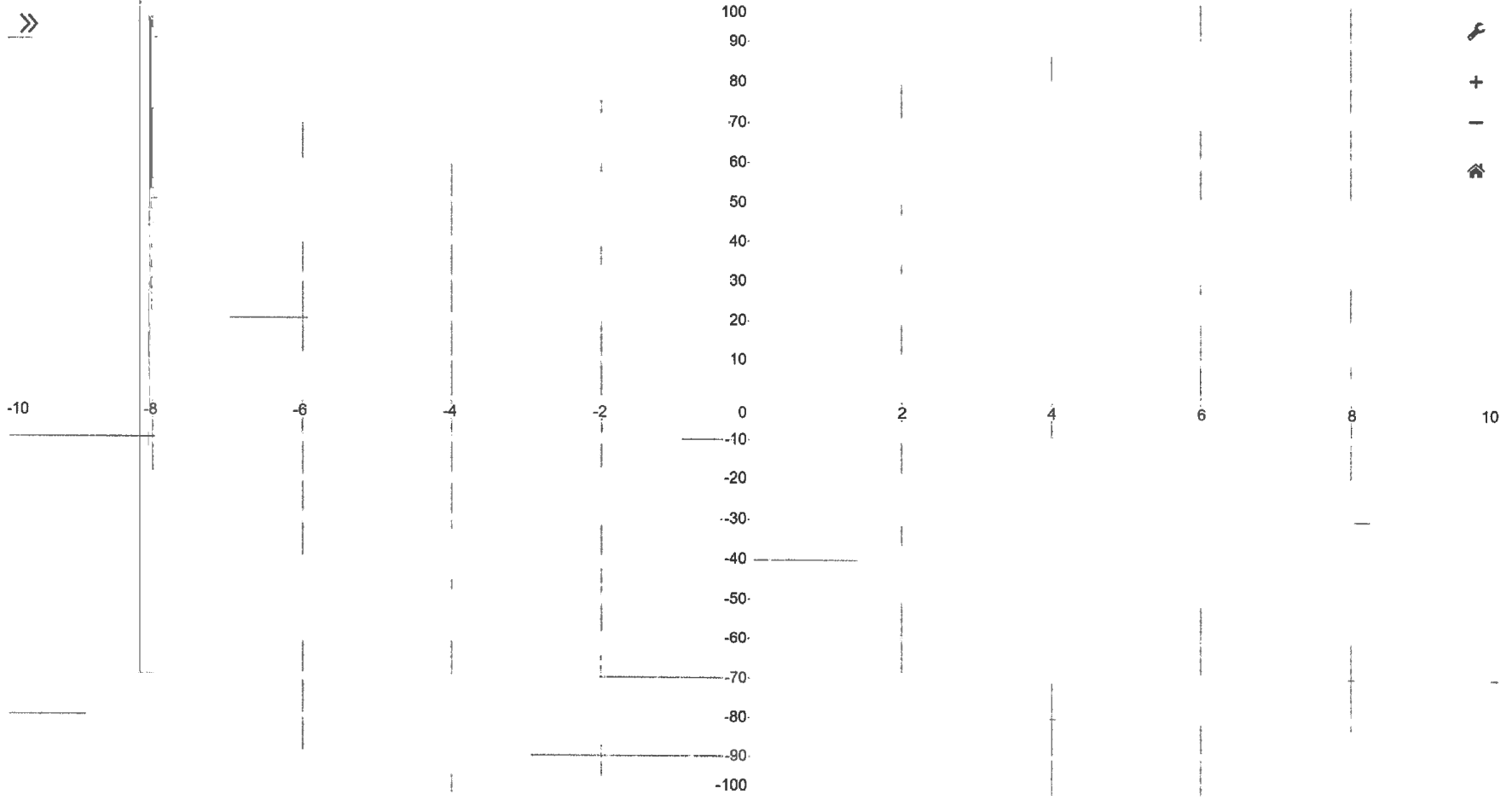
Part A

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:

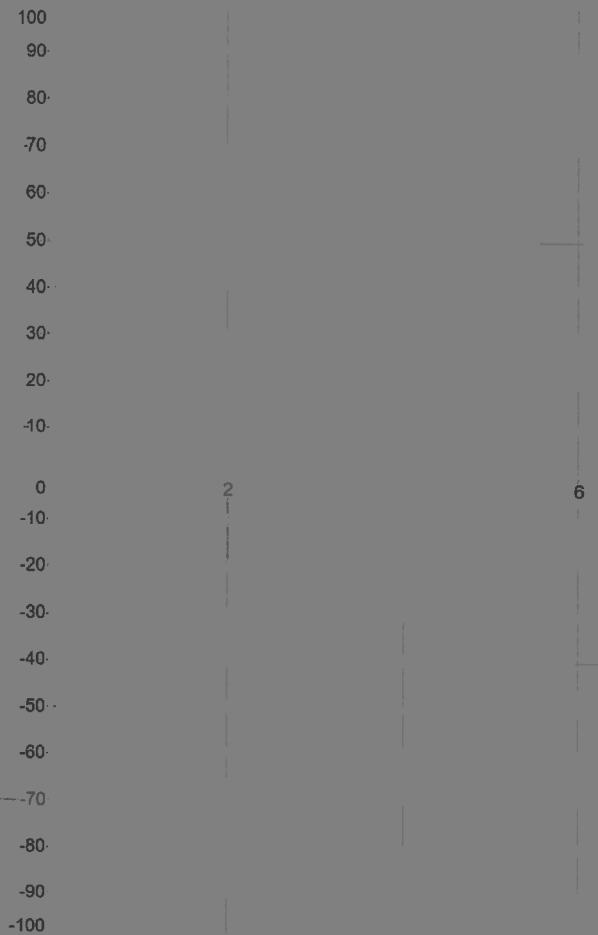
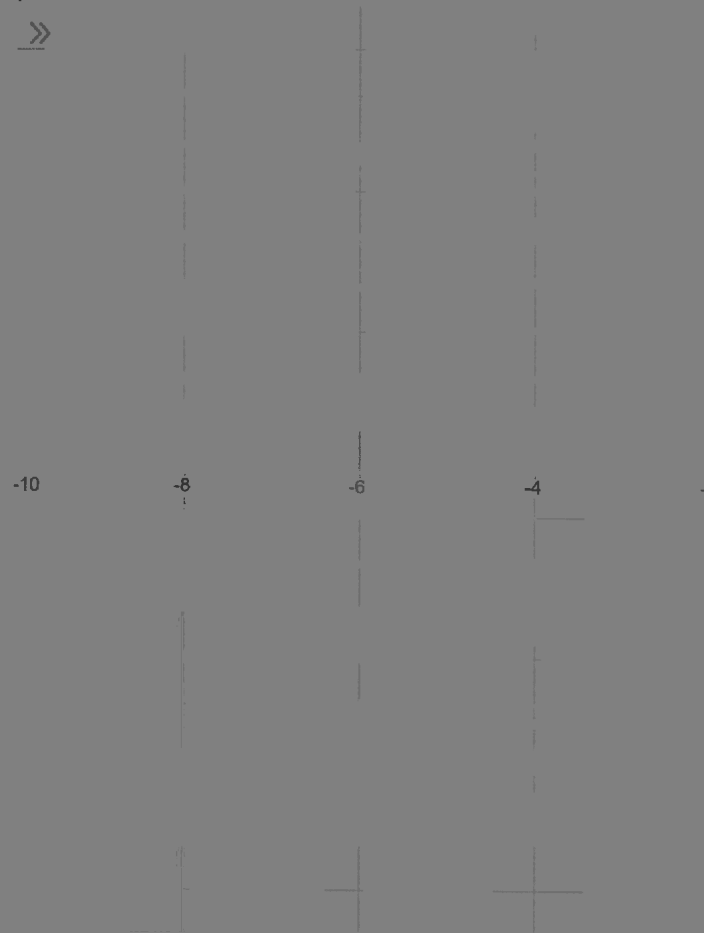


Part B

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

- What type of polynomial function is this?
- What is the domain?
- What is the range?
- Describe the end behavior:
- Describe the intervals of increase

2. Graph the function:



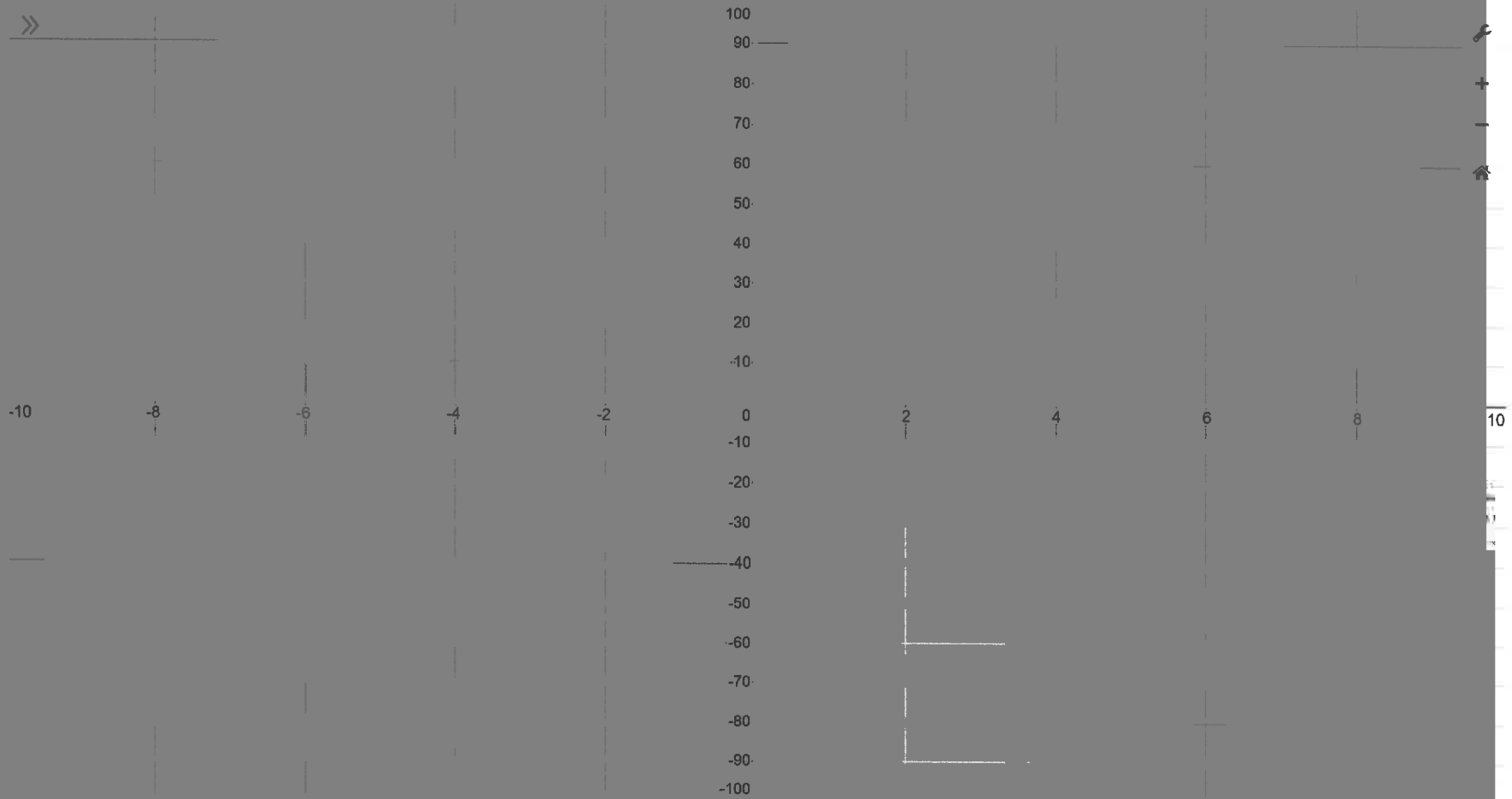
- Describe the intervals of decrease
- What are the turning points? Are they relative maxima or relative minimums?
- What are the zeros of the function?
- What is the equation for the axis of symmetry?

10

Part C

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

2.

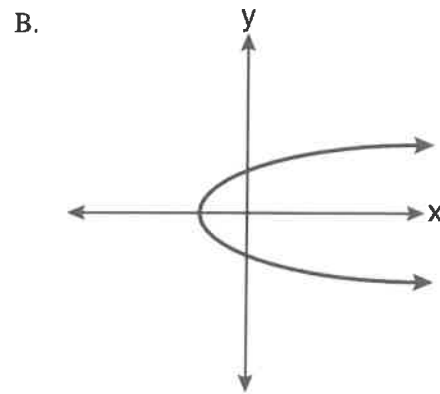
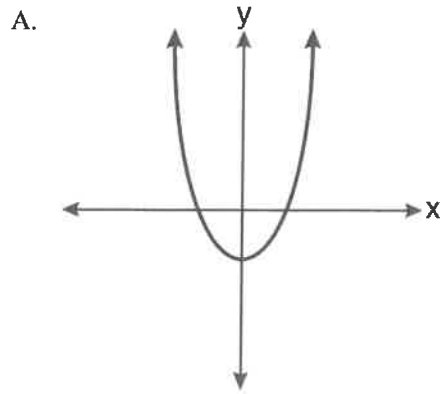


Algebra 3 School Closing Packet

Name: _____

Date: _____

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



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

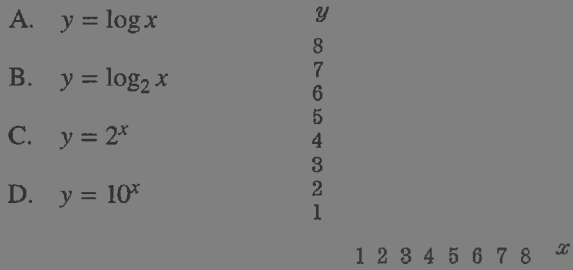


8. Which equation represents the parabola shown in the accompanying graph?

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



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

14. Which statement about the graph of the equation

13. Which equation is represented by the accompanying graph?

y

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

x

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

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

A. $y = 2^x$ B. $y = -2^x$

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

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

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

10 Solve for x : $\log(x+1) = 2$



21. Express $\sqrt{27}$ correct to three decimal places.

- A. 5.192 B. 5.196 C. 5.199 D. 5.2

25. $\sqrt[6]{108}$ is equivalent to:

- A. $\sqrt{3\sqrt{3}}$ B. $\sqrt[3]{2\sqrt[6]{17}}$

22. The numbers $\sqrt{7}$, 12 , $\sqrt[3]{25}$ arranged in increasing order

- A. 4 B. 2
C. $1 + \sqrt{15}$ D. none of these

23. $625^{-3/4} =$

- A. -125 B. 0.2 C. 125 D. 0.008

27. If x and $a \neq 0$ are real numbers, $\sqrt{\frac{49x^2}{a^4}}$ is equal to:

- A. $\frac{\pm 7|x|}{a^2}$ B. $\frac{7x}{a^2}$
C. $\frac{7|x|}{a^2}$ D. none of these

24. $\left(\frac{216}{15625}\right)^{-\frac{2}{3}}$ is equal to:

- A. $\frac{6}{25}$ B. $\frac{125}{6}$ C. $\frac{36}{625}$ D. $\frac{625}{36}$

28. Simplify: $\sqrt{56x^2y^7} \cdot \sqrt{8xy}$

- A. $8xy^4\sqrt{7x}$ B. $7x^2y^4\sqrt{64x}$
C. $8x^3y^7\sqrt{7y}$ D. none of these

29. Simplify: $\frac{\sqrt{8} + \sqrt{50}}{\sqrt{2}}$

- A. $\sqrt{29}$ B. 7
 C. $\sqrt{8} + 5$ D. none of these

33. Simplify $(\sqrt{x} - \sqrt{3})(\sqrt{x} + \sqrt{3}) - (\sqrt{x} - \sqrt{2})^2$

- A. -1 B. $\sqrt{2x - 5}$
 C. $2\sqrt{2x} - 5$ D. $2x + 2\sqrt{2x} - 5$

30. $6\sqrt{3} - \sqrt{12}$ can be written as:

- A. $\sqrt{48}$ B. $20\sqrt{0.12}$
 C. all of these D. none of these

34. If $3 + \sqrt{3}$ is divided by $2 + \sqrt{3}$, the result is:

- A. $3 - \sqrt{3}$ B. $3 + \sqrt{3}$ C. $\sqrt{3} - 3$
 D. none of these

35. The sum of $\frac{3}{2 - \sqrt{2}}$ and $\frac{3}{2 + \sqrt{2}}$ is:

- A. 4 B. 8 C. -16
 D. none of these

- A. 1.5 B. 6 C. $\frac{3}{4}$
 D. none of these

32. The value of $(2 - \sqrt[4]{9})(2 + \sqrt[4]{9})$ is:

- A. 1 B. 9 C. -5
 D. none of these

36. The sum of $\frac{5}{3 + \sqrt{3}}$ and $\frac{5}{3 - \sqrt{3}}$ is:

- A. $\frac{10}{6}$ B. 5 C. $-10\frac{3}{6}$
 D. none of these

37. The number of real solutions of the equation $(\sqrt{3x-2} + \sqrt{2x-3}) = 1$ is:

- A. 0 B. 2 C. 3 D. 4

38. Find the sum of the solutions for the following equation:

$$x + \sqrt{x+5} = 7$$

- A. 15 B. 0
C. 4 D. no solution

39. What is the sum of the solutions of:

$$\sqrt{1-x} = x + 5$$

- A. -11 B. 11 C. -3 D. -4

40. Find the solution set of the real numbers for the radical equation $\sqrt{2x+1} = 1 + \sqrt{x}$.

- A. \emptyset B. $\{0, -4\}$ C. $\{0, 4\}$
D. none of these