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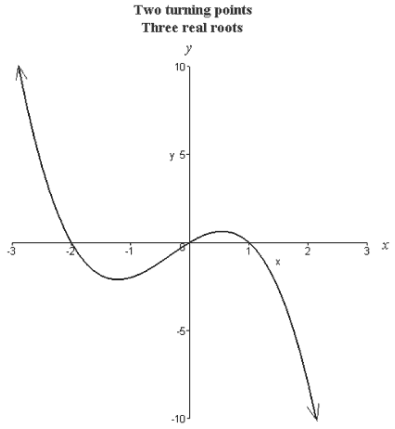
Midterm Review Modules 1–9 RUGGLES

1. Identify the domain and range of the relation shown in the table?

x	-3	-2	4	11
y	-1	3	6	8

Refer to the figure below for 2–3.



2. Write the domain and range of the function in interval notation and inequality notation.

3. Describe the end behavior of the function.

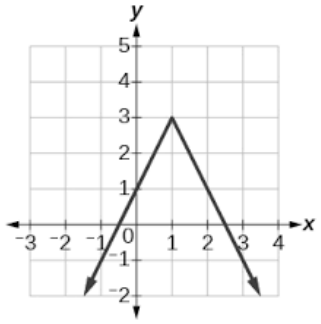
4. Find the inverse of $f(x) = \frac{1}{2}x + 3$.

5. Complete the table.

x	$y = -3\lvert x + 1\rvert$	y
-3	$y = -3\lvert(-3) + 1\rvert$	
-1		
0		
1		
3		

6. Determine whether the functions $f(x) = 2x + 4$ and $g(x) = \frac{x}{2} - 2$ are inverses.

The figure below shows a transformation of $y = \lvert x\rvert$. Refer to the figure for 7–8.



7. Write the function that is represented on the graph.

8. Write the domain and range of the graph.

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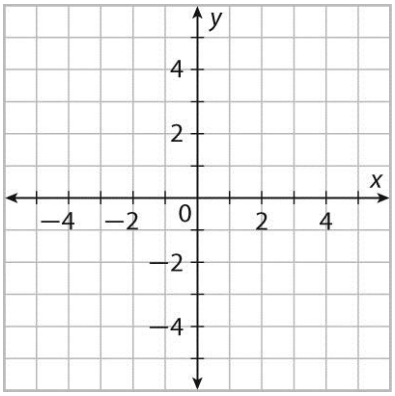
9. Solve $|x + 1| - 2 > 6$.

10. Solve $|x - 5| - 1 < 4$.

11. Solve the equation $-2|x - 1| + 3 = -3$ graphically.



12. Use fractional exponents to simplify $\sqrt[3]{x^6y^5}$.

13. Simplify $32^{\frac{2}{5}}$.

14. What is $\left(\frac{8^{\frac{2}{3}}}{64^{\frac{2}{3}}}\right)^{\frac{1}{2}}$ simplified?

15. Simplify $\frac{18x^{-4}y^6}{8^{\frac{1}{3}}x^7y^{-3}}$. Write your answer with positive exponents.

16. Which monomial has a degree of 4?

A $2x^5y^2$

B $-3x^4y^4z^4$

C $6xyz^2$

D $-5xy^2z^3$

17. What is the sum of $3x^2 + 4x - 4 - 5y^2 + 5y$ and $x^2 - x - 13 + 6y^2$?

18. Which is the correct classification of $2x^2yz + 3x^2y - 4xy$?

A binomial with a degree of 9

B trinomial with a degree of 4

C trinomial with a degree of 9

D monomial with a degree of 4

19. Simplify $(3x^3y^2 + 4x^3 - 10x^3y^2) - (-x^3 + 4x - x^3y^2)$.

Use the model below for 20–23.

20. Write an expression in simplest form to represent the perimeter of the rectangle in inches.

21. Find the perimeter when x = 3.

22. Write an expression in simplest form to represent the area of the rectangle in inches.

23. Find the area when x = 3.

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24. What is the opposite of $2x + 3y$?

25. What is the product of $(3x - 1)$ and $(-2x^2 + 3x - 4)$?

26. What is the product of $(x + 5)(x - 5)$?

27. What is the product of $(x - 8)^2$

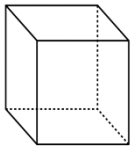
28. What is a perfect square trinomial?

29. Find the products.
    a. $(3x - 4)^2$
    b. $(3x - 1)(3x + 1)$
    c. $(2x + 3x)^2$
    d. $(ab + 2)(a - 3ab + b)$
    e. $-3x(x + 5xy - 4x^2)$

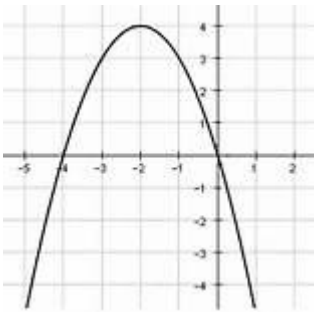
30. The volume of the solid is $2x^2 - 2x - 40$. Find an expression for the length.

H= 2

W=x - 5



31.



a. Identify the vertex.

b. Identify the axis of symmetry.

c. Find the equation of the function that represents the parabola.

d. Identify the maximum or minimum value of y.

e. The function above is translated 2 units left and 4 units up. Write an equation for this parabola.

32. For $y = -(x + 2)^2 + 3$, identify the maximum or minimum value of y. Identify it as a maximum or minimum

33. The zeros of a quadratic function are -8 and -2. Find a possible vertex.

34. Find the vertex and axis of symmetry of $f(x) = 4x^2 - 16x + 1 = 0$.

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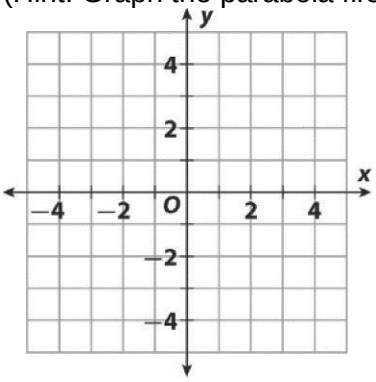
35. Use the graph of $y = -x^2 - 2x + 3$ to solve $3 = -x^2 - 2x + 3$.
(Hint: Graph the parabola first)



36. What are the solutions of $(2x + 4)(3x - 9) = 0$?

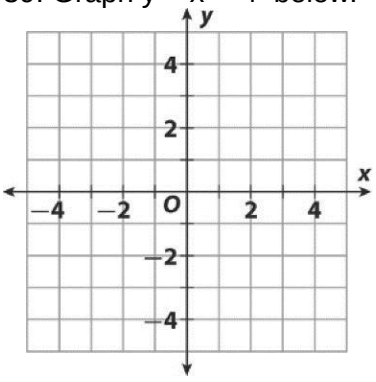
37. The height of a ball is modeled by $f(x) = -16x(x - .5)$, where x is the number of seconds after the ball is hit and $f(x)$ is the height of the ball in meters.

a. Find and interpret the vertex of the function.

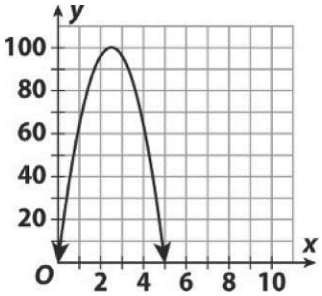
b. How long was the ball in the air? Justify your answer.

38. Find the vertex and line of symmetry of $f(x) = -3x^2 + 18x + 2 = 0$.

39. Graph $y = x^2 - 4$ below.



40. The height of a ball in feet is modeled by $f(x) = -16x^2 + 80x$, which is shown below, where x is the time in seconds after it is hit.



a. How long is the ball in the air?

_____

b. Find and interpret the vertex of the graph.

_____

41. Write an equation of a quadratic function that has x-intercepts -2 and 5.

_____

42. What are the zeros of the function: $f(x) = x(x - 1) + 3(x - 1)$?

_____

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43. What is the range of the function $y = 2(x - 1)^2 + 3$?

_____

44. Solve $2(x + 1)^2 = 18$.

_____

45. Factor: $25p^2 - 49x^2$

_____

46. Solve $2x^2 - 9x - 5 = 0$ by factoring

_____

47. Solve: $x^2 + 8x + 12 = 0$

_____

48. Factor: $x^2 – 6x – 16$

_____

49. Solve $x^2 - 6x = 40$ by factoring.

_____

50. Which of the following will simplify to the correct solutions of $y = 2x^2 + 5x – 7$?

A $\frac{-5 \pm \sqrt{25 - 56}}{4}$

B $\frac{-5 \pm \sqrt{25 + 56}}{4}$

C $\frac{5 \pm \sqrt{25 - 56}}{4}$

D $\frac{5 \pm \sqrt{25 + 56}}{4}$