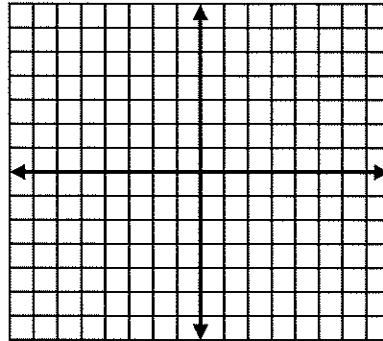1) Graph the solution to the system

$$y < 2x + 3$$

$$y \geq -\frac{1}{4}x + 6$$
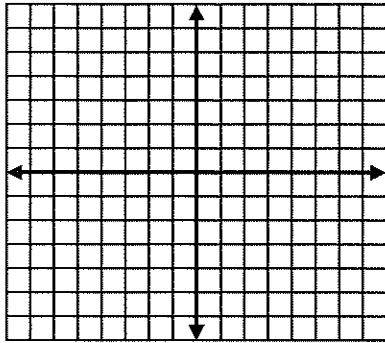
2.) Graph: $y = -3|x+1| + 4$
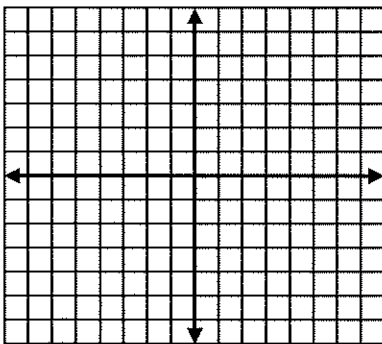

Name the Parent Function

List the Transformations
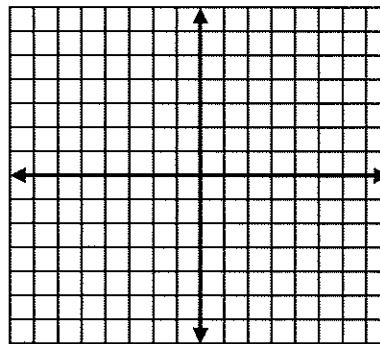
State the y-intercept

3) Graph: $f(x) = \begin{cases} -\dfrac{2}{3}x + 1 & if \ x \leq -3 \\ 3x + 5 & if \ x > -3 \end{cases}$

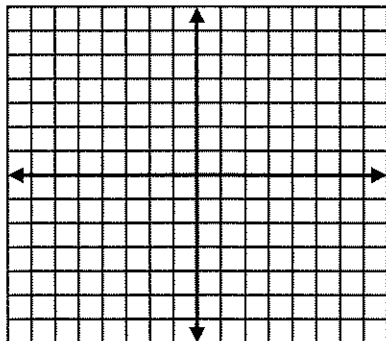State the y-intercept

4) Graph: $y = -2(x+1)^2 - 3$

Name the Parent Function

List the Transformations

State the y-intercept

6) Graph: $f(x) = 2(x-3)^3 - 5$

Name the ParentFunction

List the Transformations

State the y-intercept

7) Graph: $f(x) = -2\sqrt{(x-5)} + 3$
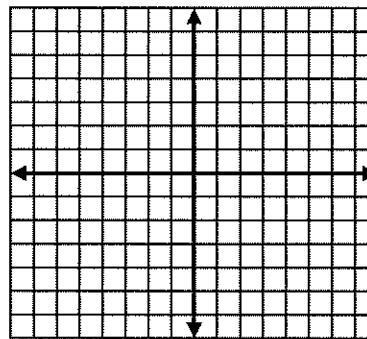
Name the Parent Functio

List the Transformations

State the y-intercept

8) Graph: $y = -2x^2 + 12x - 11$
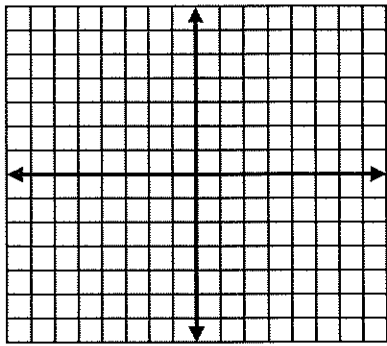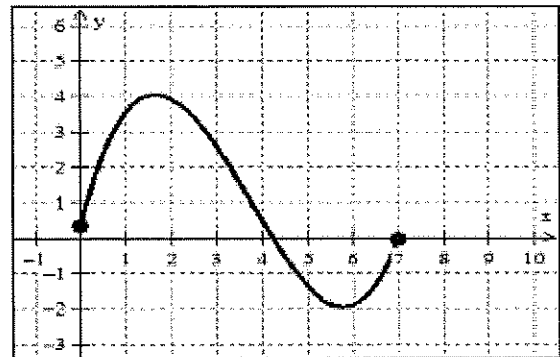
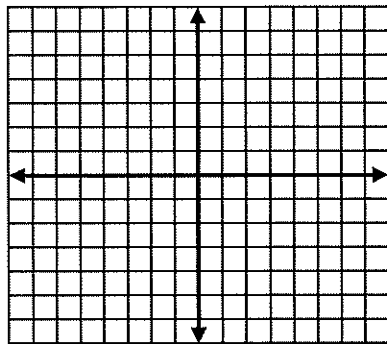Vertex

Axis of Symmetry

Y-Intercept

9. Give the Domain and Range of the following

Vertex

10) Graph: $y = (x-3)(x+5)$

Axis of Symmetry

Y-Intercept

11. Solve the system $\begin{array}{l} y = 3x + 1 \\ y = 2x \end{array}$
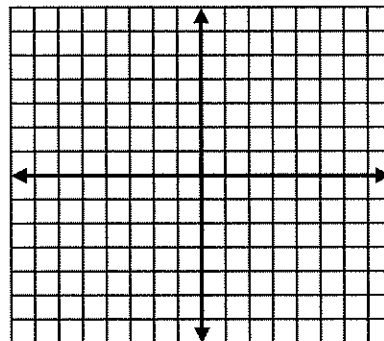
For questions 10- 15.

If $f(x) = 3x + 5$, $g(x) = 2x^2$, and $h(x) = \begin{cases} \dfrac{1}{4}x & if\ x < -1 \\ 3x + 2 & if\ x \geq 0 \end{cases}$, **find the requested values.**

10. $h(3)$	11. $h(-1)$	12. $f(h(-8))$
13. $h(g(5))$	14. $f(g(x))$	15. $f^{-1}(x)$

For questions 16- 18. Solve and graph the following absolute value equations or inequalities.

16. $10x - 8 \geq 12 + 5x$	17. $-30 < 2x - 10 \leq 20$	18. $\|4x - 2\| > 30$
Write your solution set using Interval Notation:	Write your solution set using Interval Notation	Write you solution set using Interval Notation:

Algebra Midterm Exam Review 2019

Graphing Calculator Allowed Pages 3-6

Part 2: Show all work. Circle final answers.

19. Simplify $\left(2x^3 + 4x - 3\right) - \left(6x^3 - 2x^2 + 4x - 1\right)$	20. Multiply $(3x-2)(2x+5)$	21. Simplify $5(2x-3y) - 2x(4x^2 - 4xy + 2)$
22. Expand: $(5x-2)^2$	23. Expand: $(3x-2)(3x+2)$	24. Solve the system $2x + 4y = 8$ $2y = 4 - x$ Solution:_____
25. Solve the system: $x = 4y - 10$ $-5x + y = -19$ Solution:_____	26. Solve the system $5x + 3y = -4$ $7x - y = 35$ Solution:_____	27. Solve the 3 variable system $\begin{cases} 2x - 4y + 3z = 0 \\ x - 2y - 5z = 13 \\ 5x + 3y - 2z = 19 \end{cases}$ Solution: _____

Algebra Midterm Exam Review 2019

Part 3: *Factor* the following quadratic expressions completely.

28. $64 - 9x^2$	29. $x^2 + 7x + 10$	30. $2x^2 + 7x + 6$
31. $5x^2 - 320$	32. $3x^3y - 18x^2y^4$	33. $6x^2 - 13x - 5$
34. Solve: $(x+3)(x-2) = 0$	35. Solve: $2x^2 - 36x + 162 = 0$	36. Solve: $4x^2 - 25 = 0$

Algebra Midterm Exam Review 2019

Show your work in a clear and organized manner.

37. Michaela's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 5 adult tickets and 1 child ticket for a total of $40. The school took in $260 on the second day by selling 10 adult tickets and 14 child tickets. What is the price each of one adult ticket and one child ticket?

38. The sports store sold 10 balls, 3 bats, and 2 bases for $99 on Monday. On Tuesday they sold 4 balls, 8bats, and 2 bases for $78. On Wednesday they sold 2 balls, 3 bats, and 1 base for $33.60. What are the prices of 1 ball, 1 bat, and 1 base?

39. A package of supplies is tossed from a helicopter at an altitude of 200ft. The package's height above the ground is modeled by $h(t) = -16t^2 + 28t + 200$

   A) What is the height of the ball after 3 seconds?

   B) What is its maximum height?

   C) After how many seconds will it return to the ground?

40. The price of a HK drama ticket in 1995 can be described by the function $y = \dfrac{1}{32} x^2 + 2x + 8$, where y represents the price and x represents to year, with x = 0 representing 1995.

   A) What was the price of a ticket in 1995?

   B) What was the approximate price of a ticket in 2010?

41. A soft drink manufacturer has a daily production cost of $C = 10,000 - 120x + .055x^2$ where C = total cost in dollars and x corresponds to the number of units produced.

    a. According to the model, what was the minimum number of units produced and what was the minimum cost?

    b. What was the cost for 3000 units?

Part 4: *Simplify the following.*

42. $\sqrt{18} + \sqrt{2} - \sqrt{98}$	43. $(6\sqrt{5})^2$	44. $(3\sqrt{5})(-2\sqrt{15})$
45. $\sqrt{-7} \cdot \sqrt{-14}$	46. Expand: $(3 - 2i)(3 + 2i)$	47. Simplify : $(2+5i) - (3-4i)$
48. Simplify: $\dfrac{3-4i}{2i}$	49. Write in simplest radical form: $\dfrac{-10 \pm \sqrt{60}}{24}$	50. Simplify: $(3 - \sqrt{-5})(6 + \sqrt{-10})$

Algebra Midterm Exam Review 2019