

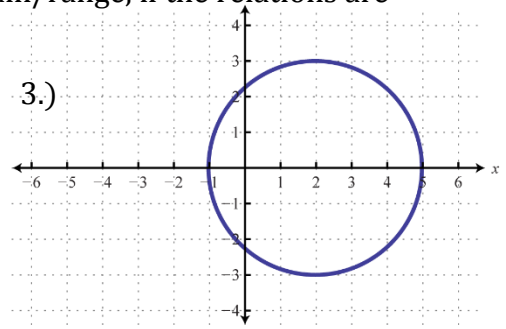
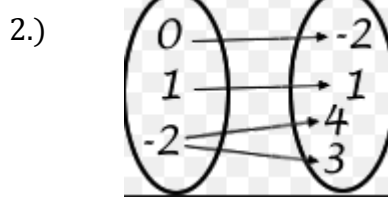
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Linear Functions

Determine whether the relations are functions, state the domain/range, if the relations are functions then state whether they are linear or non-linear.

1.)

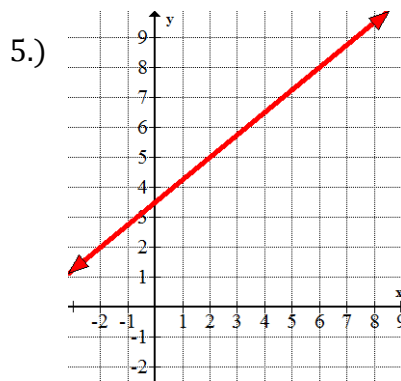
x	y
9	2
3	-2
-3	-6
-9	-10



Find the slope of the following linear functions.

4.)

x	$f(x)$
-2	-4
-1	-1
0	2
1	5
2	8
3	11
4	14



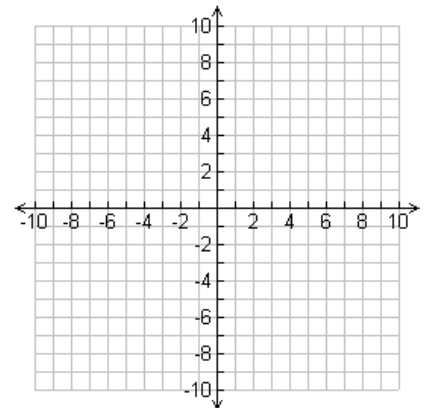
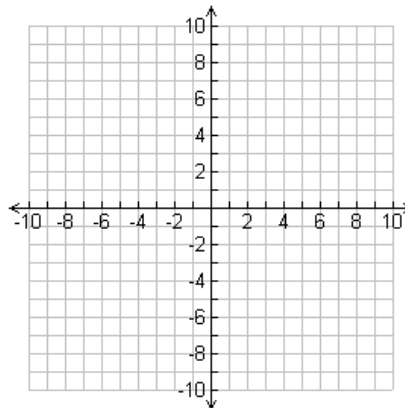
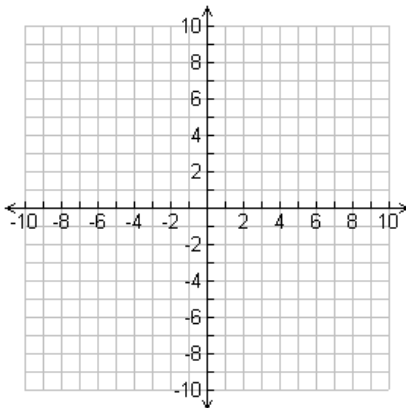
6.) $(-4, 3)$ & $(-1, 5)$

Graph the following lines.

7.) $y = -\frac{3}{4}x + 2$

8.) $4x - 3y = 12$

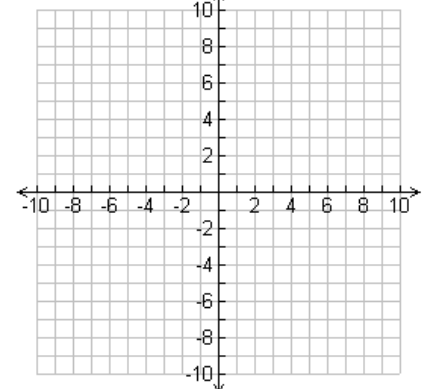
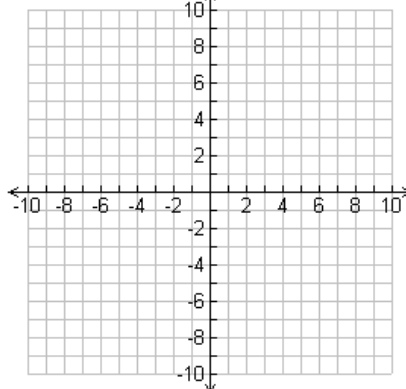
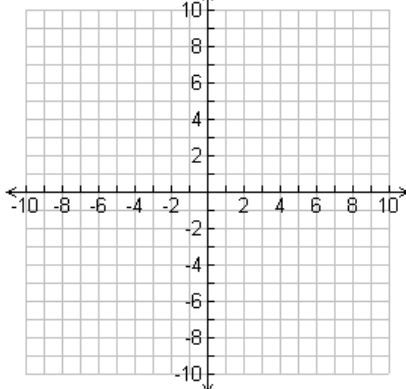
9.) $x = -4$



10.) $y = 5$

11.) $2y = 3x - 4$

12.) $5x = -2y + 10$



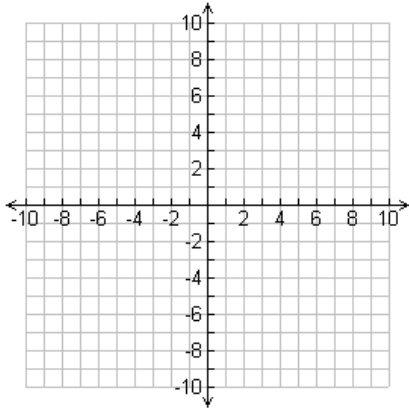
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Piecewise Functions

13.) a.) Evaluate: $f(0)$ and $f(5)$

b.) Domain c.) Range d.) Graph

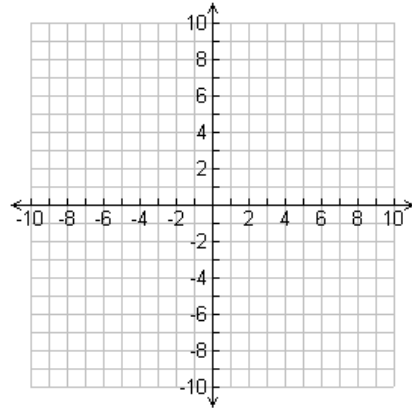
$$y = \begin{cases} x + 1 & x \geq 1 \\ -2x - 2 & x < 1 \end{cases}$$



14.) a.) Evaluate: $f(2)$ and $f(10)$

b.) Domain c.) Range d.) Graph

$$\begin{cases} |x - 1| & -1 \leq x < 3 \\ -x + 1 & x \geq 3 \end{cases}$$



Properties of Exponents

15.) $5(x^0)y^{-1}$

16.) $(2d^7)(-4d^9d^5)$

17.) $\frac{9x^{10}y^3}{-x^5y^3}$

18.) $(6x^3y)(x^2)^{-2}$

Polynomials

Perform the given operations and classify by degree and number of terms. Write in standard form.

19.) $(3x^2 + 5x^3 - x + 4) + (-4 - 3x^3 + 4x^2)$ 20.) $(10 - 3x^2 + x) - (-3x^2 + 4x - 5)$

21.) $(-3x - 4)(5x + 7)$ 22.) $(3x - 2)(x^2 + 2x - 1)$ 23.) $5x^2(x^2 - 3x + 4)$

Factor the following quadratic expressions.

24.) $6x^2 - 5x - 21$

25.) $x^2 + 2x - 63$

26.) $x^2 - 16$

27.) $4x^2 - 81$

28.) $x^3 + 3x^2 - 4x - 12$

29.) $2x^2 - 2x - 12$

30.) $-2x^2 - 3x + 35$

31.) $3x^3 - 12x^2 - 5x + 20$

32.) $x^2 - 10x + 25$

33.) $4x^2 + 12x + 9$

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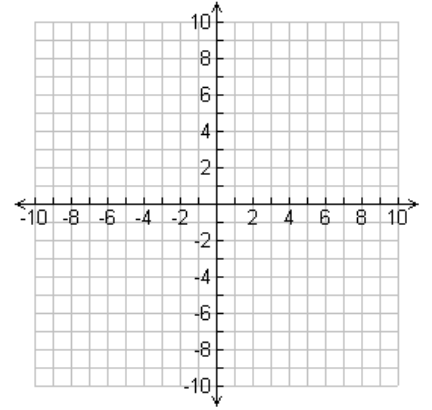
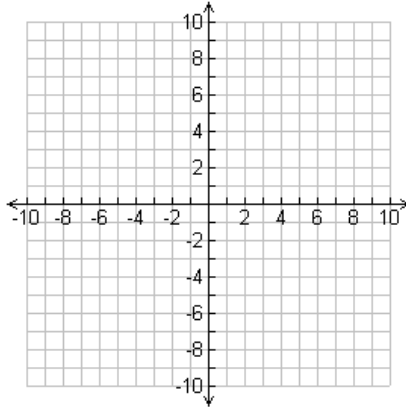
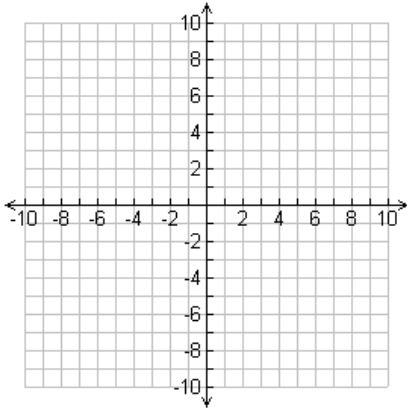
Graphing Quadratic Functions

- a.) Graph the following quadratic functions. b.) Name the domain and range.
 c.) Name intervals of increase/decrease d.) What is the vertex and is it a max or min?
 e.) Name the axis of symmetry. f.) What is the y-intercept?

34.) $y = \frac{1}{2}(x + 3)^2 - 8$

35.) $y = -3(x - 2)^2 + 3$

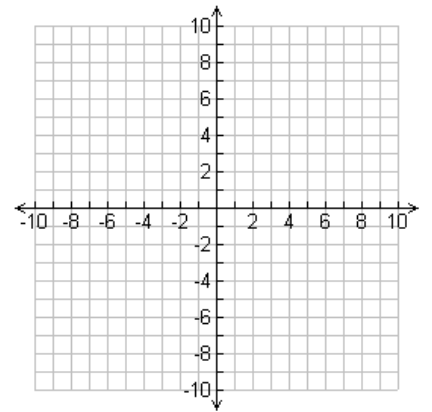
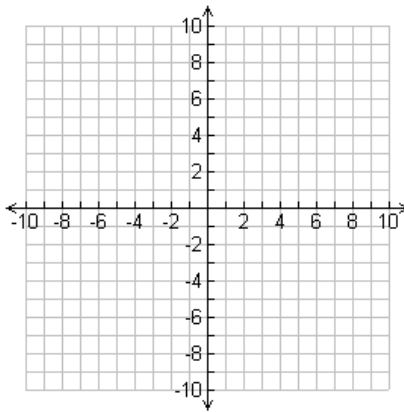
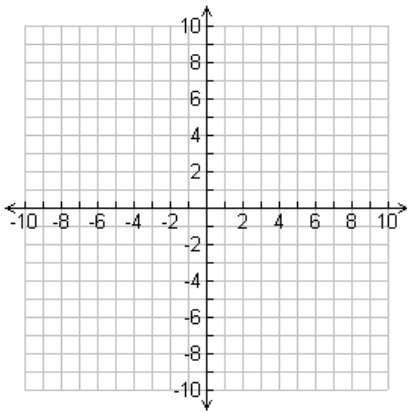
36.) $y = (x)^2 - 4$



37.) $y = x^2 - 2x - 3$

38.) $y = x^2 - 4$

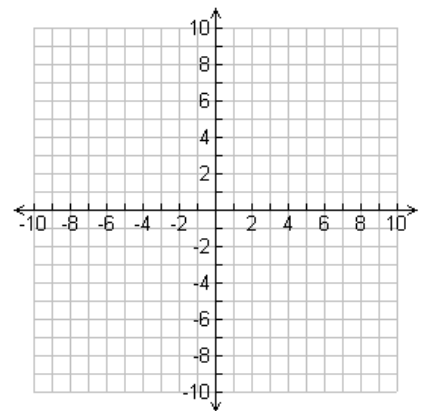
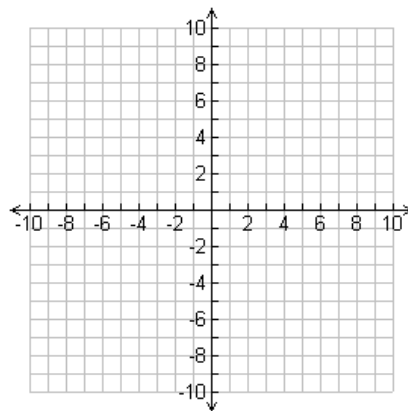
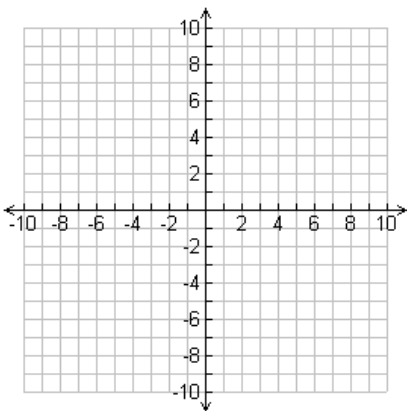
39.) $y = 4x^2 + 8x - 5$



40.) $y = (x - 3)(x + 3)$

41.) $y = (x + 1)(x - 5)$

42.) $y = -(x + 4)(x - 2)$



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Properties of Radicals

- | | | | | |
|-----------------------------------------------|-----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------|
| 43.) $27^{\frac{2}{3}}$ | 44.) $\sqrt[4]{625}$ | 45.) $32^{\frac{3}{5}}$ | 46.) $\sqrt[3]{24}$ | 47.) $125^{\frac{2}{3}}$ |
| 48.) $\sqrt{192x^2}$ | 49.) $\frac{7}{\sqrt{10}}$ | 50.) $\frac{12}{2+\sqrt{3}}$ | 51.) $\frac{1-\sqrt{2}}{3+\sqrt{5}}$ | 52.) $\sqrt{3} \cdot \sqrt{6}$ |
| 53.) $\sqrt{2} \cdot \sqrt{8} \cdot \sqrt{3}$ | 54.) $\sqrt{5} + \sqrt{20} - \sqrt{45}$ | 55.) $\sqrt{3}(\sqrt{12} + \sqrt{27})$ | | |

Solving Quadratic Equations

Solve the quadratic equations by **factoring**. (show both solutions separately)

- 56.) $2x^2 + 9x - 35 = 0$ 57.) $x^2 - 6x - 27 = 0$ 58.) $2x^2 - 4x - 30 = 0$

Solve the quadratic equations by **square root method**. (show both solutions separately)

- 59.) $3x^2 - 21 = 0$ 60.) $-2(x + 1)^2 + 4 = 0$ 61.) $-5x^2 = -125$

Solve quadratic equations by **completing the square**. (show both solutions separately)

- 62.) $x^2 - 4x + 7 = 0$ 63.) $2x^2 - 4x + 10 = 0$ 64.) $x^2 - 6x + 1 = 0$

Solve quadratic equations by the **quadratic formula**. (show both solutions separately)

- 65.) $3x^2 + 2x - 4 = 0$ 66.) $x^2 - 5x + 5 = 0$ 67.) $-2x^2 - 3x + 4 = 0$

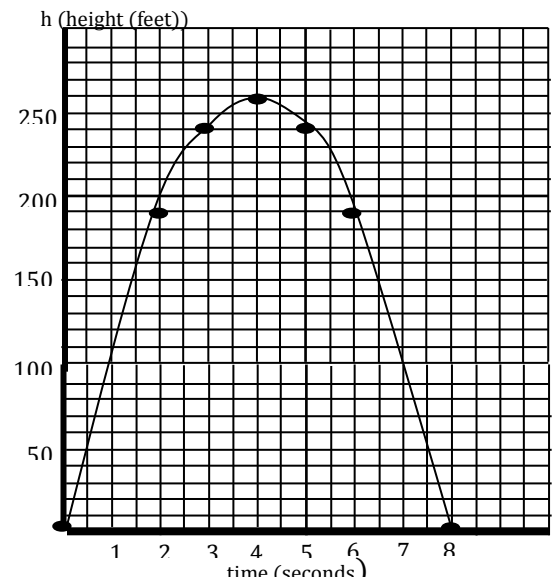
Solve quadratic equations by the **appropriate method**. (show both solutions separately)

- 68.) $(x + 3)^2 + 4 = 0$ 69.) $5x^2 - 2x + 5 = 0$ 70.) $4x^2 + 16 = 0$
 71.) $3x^2 + 2x - 8 = 0$ 72.) $x^2 - 6x + 12 = 0$ 73.) $-(x + 1)^2 - 9 = 0$

Quadratic Applications

74.) The graph below shows the height h in feet of a small rocket t seconds after it is launched. The path of the rocket is given by the equation: $h = -16t^2 + 128t$.

- How long is the rocket in the air?
- What is the greatest height the rocket reaches?
- About how high is the rocket after 1 second?
- After 2 seconds, about how high is the rocket?
- After 6 seconds, about how high is the rocket and is the rocket going up or going down?



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75.) Ms. Feo jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. Her height as a function of time could be modeled by the function $h(t) = -16t^2 + 16t + 480$, where t is the time in seconds and h is the height in feet.

- a.) How long did it take for Ms. Feo to reach his maximum height?
- b.) What was the highest point that Ms. Feo reached?
- c.) Ms. Feo hit the water after how many seconds?

76.) Mr. Tapia is building a rectangular wading pool for his precious best friend, Buster. He wants the area of the bottom to be 54 ft^2 . He also wants the length of the pool to be 3ft longer than twice its width. What are the dimensions of Buster’s pool?

77.) Ms. Cormier is coaching soccer and kicks a soccer ball to a student across the field at practice. After t seconds, the ball is kicked into the air from the ground level and reaches a height of h feet given by the function: $h(t) = 144t - 16t^2$.

- a.) What is the height of the ball after 3 seconds?
- b.) What is the maximum height the ball will reach?
- c.) After how many seconds will the ball hit the ground?

78.) The profit from selling PSHS theater tickets depends on the ticket price. Using past receipts, we find that the profit can be modeled by the function: $P(x) = -15x^2 + 600x + 60$, where x is the price of each ticket. We want to find the ticket price that gives the maximum profit, and also find that maximum profit.

Operations of Complex Numbers

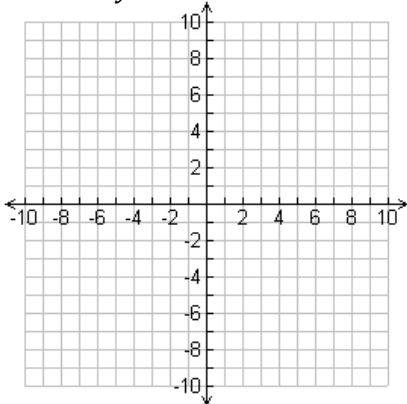
Simplify

- 79.) $(3 - 2i)(3 + 2i)$ 80.) $5(6 - 4i)$ 81.) $7i(3 - 2i)$ 82.) $(-4 + 5i)(3 - 2i)$
- 83.) $(2 - 4i) - (5 + 3i)$ 84.) $(-6 + 4i) + (5 - 3i)$ 85.) $\frac{5}{3+2i}$ 86.) $\frac{2-4i}{1+3i}$

Systems of Quadratic inequalities

Graph the systems of quadratic inequalities to solve.

87.) $\begin{cases} y \geq x^2 - 4 \\ y < -x^2 - x + 2 \end{cases}$



88.) $\begin{cases} y \geq -x^2 + 3 \\ y \leq x^2 + 2x - 4 \end{cases}$

