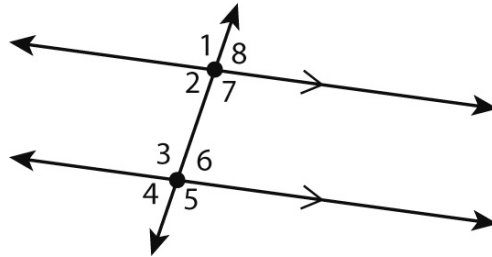# Lines, Angles, and Triangles
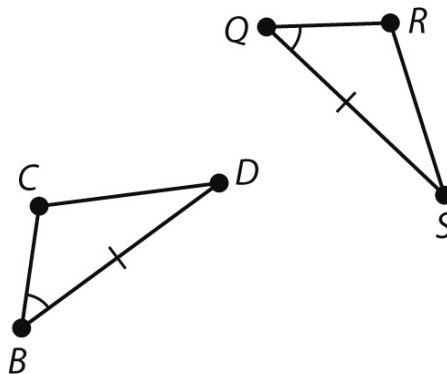
Use the figure for 1–2.

1. Name all angles congruent to $\angle 1$.

2. Name all angles supplementary to $\angle 3$.

3. Write an equation for the line that passes through $(2, -5)$ and is parallel to $3x + 4y = 8$.

4. For the triangles shown, state the additional congruency statement needed to prove $\triangle BCD \cong \triangle QRS$ for the given theorem.
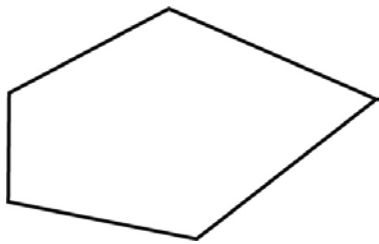

   a. SAS Theorem

   b. ASA Theorem

Lines, Angles, and Triangles

5. Write an equation for the line that passes through (10, 0) and is perpendicular to $3x - y = 7$.
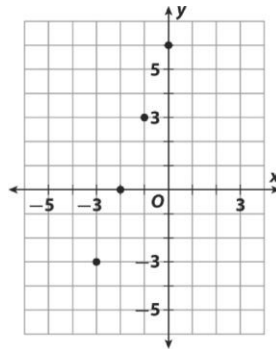
6. What is the sum of the interior angles of this polygon?
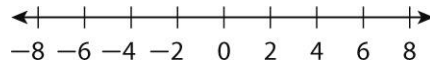

8. If $m\angle 1 = 53°$, what is $m\angle 3$?
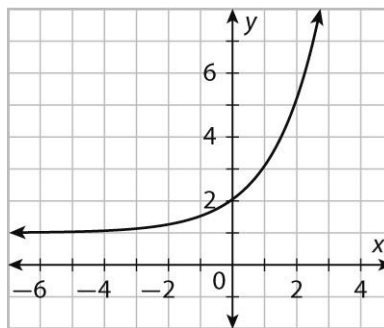
Characteristics of Functions

1. What is the domain of the relation shown on the graph?

2. Graph the solutions for $20 \geq 4(1-x)$ on the number line.

Refer to the graph below for 3–4.

3. Write the domain and range of the function in interval notation.
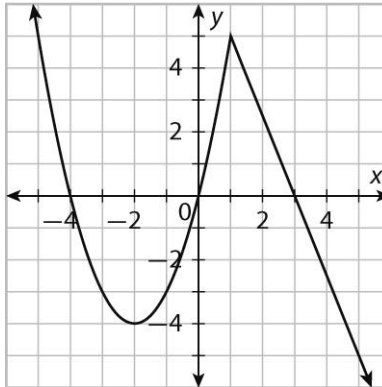
4. Describe the end behavior of the function.

5. Solve $-12 \leq -2|x+5|$.

6. Find the inverse of $f(x) = \dfrac{4x+7}{12}$.

Characteristics of Functions

Refer to the figure below for 7–8.

9. Identify the intervals where the graph is decreasing.

   A $(-\infty, -2)$ Yes   No

   B $(-4, 0)$ Yes   No

   C $(-2, 1)$ Yes   No

   D $(1, +\infty)$ Yes   No

10. What is the rate of change on the interval $(1, +\infty)$?

11. Graph the solutions to $-3|x+1|+2 = -4$.
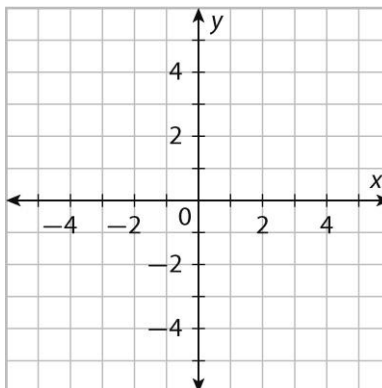
Polynomial Operations

1. Choose Yes or No. Can each expression be evaluated?

   A $(-8)^{-\frac{1}{3}}$ Yes   No

   B $-(81)^{\frac{1}{4}}$ Yes   No

   C $\left(-\dfrac{1}{125}\right)^{\frac{1}{3}}$ Yes   No

   D $(-64)^{\frac{1}{4}}$ Yes   No

2. What is the sum of $(1.2x^5 - 5x^3 - 0.7) + (3.7x^5 + 3)$?

3. What is the product of $13x^3yz^2$ and $6x^3y^2z$?

4. Multiply $(3x - 2)(2x + 6)$. What is the product?

5. Multiply $(2x+1)(3x^2+5x-1)$. What is the product?

6. Choose True or False for each statement about the polynomial $3x^2y^2 + 5xy - 8$.

   A The degree is 3.   True   False

   B The polynomial is a trinomial.   True   False

   C -8 is a coefficient.   True   False

   D 5 is a constant term.   True   False

7. Simplify $9m^2n - 9m^2 + 7n - 14m^2n - m^2$.

8. Subtract $\left(\dfrac{21}{2}x^2 + 9\right) - \left(\dfrac{1}{2}x^2 - 5x - 2\right)$.

9. Simplify $9m^2n - 9m^2 + 7n - 14m^2n - m^2$.

Polynomial Operations

10. Multiply $(5t^2 - 13t)(t + 5)$.

11. Multiply $(x - 4)^3$.

12. Multiply $(2x + 1)(x^3 - 1)$.

13. What is the value of $\dfrac{1}{2}x^3 - x^2 + \dfrac{1}{5}x$ when $x = -\dfrac{2}{3}$?

14. What is the degree of the polynomial $6x^3y^2 + 7xy^4z - 4x^2y + 5$?

15. Multiply $(2x + 3)(x^3 - 2x^2 + x - 5)$.

16. Multiply $\left(\dfrac{1}{2}x + \dfrac{3}{4}\right)^2$.

Quadratic Equations and Models

1. Solve $-5(2x - 3)^2 = -45$.

2. Which type of function can approach zero as x decreases without end?

   A linear

   B quadratic

   C exponential

   D constant

3. Factor $x^2 + 29x + 210$.

4. What is the solution to $2x^2 - 24 = -8x$?

5. A rectangular field has dimensions of $(2x - 3)$ yards and $(x + 4)$ yards. The area of the field is 285 square yards. What are the length and width of the field?

6. Factor $6x^3 - 3x^2 - 30x$.

7. Solve $x^2 + 10x = -20$.

Quadratic Equations and Models

8. Solve $0.1x^2 - 0.6x = 0.7$.

9. Find the zeros of $y = 4x^2 - 12x - 16$.

10. Solve $-x + 3x^2 - 2 = 0$.

11. Solve $-4x^2 - 5x = -9$.

12. The function $h(t) = -16t^2 + h_0$ gives the height (in feet) of a ball dropped from a height of h_0 after t seconds. A ball is dropped from a height of 12 feet.
    After how many seconds does the ball hit the floor?