

**SUMMER WORK is due at the beginning of class on the FIRST DAY OF SCHOOL. It is graded!**

Welcome to **Accelerated GSE Geometry B/Algebra II** at Sandy Creek High School.

I am excited about the upcoming year! In order for us to hit the ground running, I need to ask you to spend some time this summer reviewing math content. Accelerated GSE Geometry B/Algebra II is a course in which the concepts from the beginning lessons build upon one another and are essential to the mastery of the material that will be encountered later in the semester. Your success in class will be the result of the consistency of your study and homework habits. Reviewing class notes each night and diligent homework efforts will greatly enhance your learning process. You are a student whose job and responsibility is to be the best student that you can be!

During the first semester, we will be learning many new concepts in the course as well as preparing for the End of Course Milestone in **December**. Because of the pace and rigor of the course, there will not be a lot of time to spend reviewing topics that you were exposed to in Accelerated Algebra I/GSE Geometry A or previous math courses. **When completing this packet, please be sure to show your work.** You may need to use graph paper for some problems. Be sure to make note of the problems that you have difficulty solving. I will be checking my email throughout the summer; please feel free to email me with questions. *I will collect these problems on the first day of school and you will be assessed over this material the Wednesday of the second week of school.*

Start your year off on the right track by completing these problems before school begins. As you complete this packet, you may want to use a calculator. We will be using graphing calculators in Accelerated GSE Geometry B/Algebra II. If you are looking to purchase a graphing calculator, I recommend a TI-84 or TI-84 Plus.

I am looking forward to working with each of you next year. Please feel free to contact Mrs. Maddox ([maddox.amy@mail.fcboe.org](mailto:maddox.amy@mail.fcboe.org)) if you have any questions or concerns.

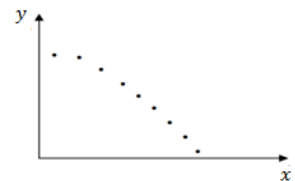
See you in August! 😊

Mrs. Maddox

Accelerated GSE Geometry B/Algebra II Teacher

- If  $\angle A$  and  $\angle B$  are supplementary, and  $m\angle A = 57^\circ$ , what is the  $m\angle B$ ?
- The ratio of the measures of two supplementary angles is 8:4. What is the measure of the smaller angle?

- Which situation best fits the graph below and what type of correlation is it?



3. Consider the construction of the angle bisector shown.

Which could have been the first step in creating this construction?

- Place the compass point on point A and draw an arc inside  $\angle Y$ .
- Place the compass point on point B and draw an arc inside  $\angle Y$ .
- Place the compass point on vertex Y and draw an arc that intersects  $\overline{YX}$  and  $\overline{YZ}$ .
- Place the compass point on vertex Y and draw an arc that intersects point C.


- distance traveled vs. cost of gas; negative correlation
  - distance traveled vs. cost of gas; positive correlation
  - time traveled vs. distance from destination; negative correlation
- Two of the three angle measures in a triangle are given. Which are angle measures of an acute triangle?
    - $11^\circ, 79^\circ$
    - $11^\circ, 59^\circ$
    - $11^\circ, 89^\circ$
    - $11^\circ, 29^\circ$

6. Consider the beginning of a construction of a square inscribed in circle  $Q$ .

Step 1: Label point  $R$  on circle  $Q$ .

Step 2: Draw a diameter through  $R$  and  $Q$ .

Step 3: Label the point where the diameter intersects the circle as point  $T$ .



What is the next step in this construction?

A. Draw radius  $\overline{SQ}$ .

B. Label point  $S$  on circle  $Q$ .

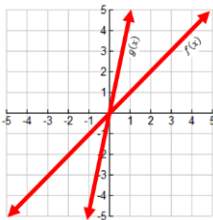
C. Construct a line segment parallel to  $\overline{RT}$ .

D. Construct the perpendicular bisector of  $\overline{RT}$ .

7. In right triangle  $ABC$ , angle  $A$  and angle  $B$  are complementary angles. The value of  $\cos A$  is  $\frac{5}{13}$ . What is the value of  $\sin B$ ?

8. A research biologist starts with 100 bacteria and watches it double in number each day. Which equation will give the number of bacteria as a function of  $x$ , the number of days?
- a.  $y = 2^x$                       b.  $y = 100^x$
- c.  $y = 2(100)^x$                 d.  $y = 100(2)^x$

9. The graphs of  $f(x)$  and  $g(x)$  are shown below. Which describes the transformation from  $f(x)$  to  $g(x)$ ?

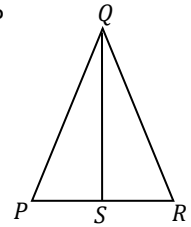


- a. translation up                      c. rotation
- b. translation down                  d. reflection

10. A trading card increases in value by 2% each year. In 2005, it was worth \$8. About how much is it worth in 2011?

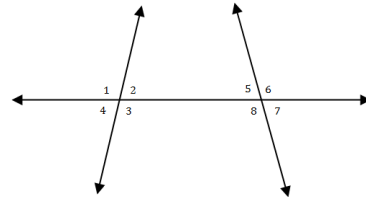
11. If a pool table measures 4 feet by 8 feet, what is the length from the back edge of the top left pocket to the bottom right pocket to the nearest tenth?

12. In the figure, why is  $\overline{QS} \cong \overline{QS}$ ?



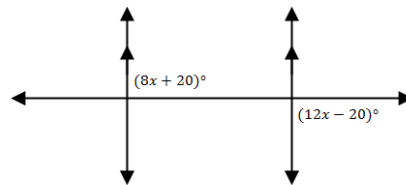
- a. all altitudes are congruent
- b. Symmetric Property of Congruence
- c. Reflexive Property of Congruence
- d. Transitive Property of Congruence

13. Which names a pair of corresponding angles?



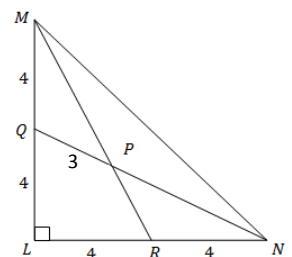
- a.  $\angle 1$  and  $\angle 6$                       c.  $\angle 2$  and  $\angle 7$
- b.  $\angle 3$  and  $\angle 8$                       d.  $\angle 3$  and  $\angle 7$

14. What is the value of  $12x - 20$ ?

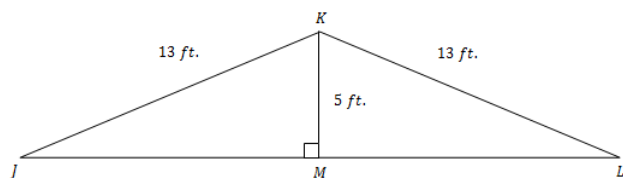


15. To the nearest tenth, what is the altitude of an equilateral triangle whose sides measure 43 centimeters?

16. What is  $\overline{MP}$ ? \_\_\_\_\_ If  $\overline{QP}$  is 3.



The figure represents the wooden truss used to support the roof of a garage. Use the figure for exercises 17 and 18.



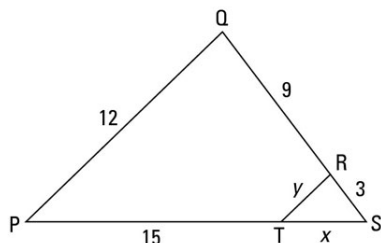
17. What postulate or theorem can be used to prove  $\triangle JKM \cong \triangle LKM$ ?

- a. SSS b. SAS c. ASA d. HL

18. Given that  $\overline{ML} = 12$  feet, how wide is the garage?

19. Given:  $\overline{PQ} \parallel \overline{TR}$

Find:  $x$  and  $y$

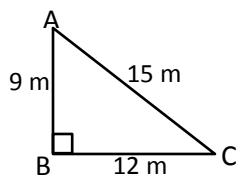


20. Which polygon has line symmetry but not rotational symmetry?  
 a. rectangle b. square c. rhombus d. kite

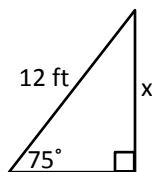
21. Which CANNOT be used to prove that a quadrilateral is a parallelogram?

- a. One pair of opposite sides are parallel.  
 b. Both pairs of opposite sides are parallel.  
 c. Both pairs of opposite sides are congruent.  
 d. One pair of opposite sides is both parallel and congruent.

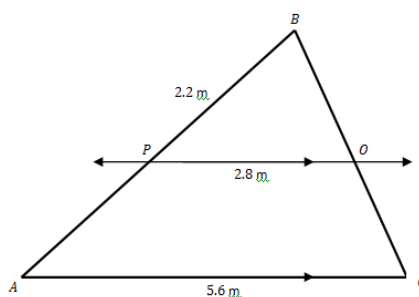
22. Triangle ABC is given below. What is the value of  $\cos A$ ?



23. A 12-foot ladder is leaning against a building at a  $75^\circ$  with the ground. Write an equation that can be used to find the height of the building.



24. To the nearest tenth, what is  $AP$ ?



25. Susan is 5 feet 9 inches tall. To find the height of a tree, she measured her shadow and the tree's shadow. Her shadow was 8 feet long when the tree's shadow was 30 feet long. To the nearest foot, how tall is the tree?

26.  $\overline{MN}$  with endpoints  $M(9, 3)$  and  $N(-1, 5)$  is dilated by a scale factor of 2.5. To the nearest tenth, what is the length of  $\overline{M'N'}$ ?

27. The legs of a right triangle measure 11.4 meters and 15.1 meters. To the nearest tenth, which could be the measure of the smallest angle?

- a.  $31.1^\circ$  b.  $38.6^\circ$  c.  $37.1^\circ$  d.  $52.9^\circ$

28. When the angle of elevation to the sun is 26 degrees, a flagpole casts a shadow that is 82 feet long. What is the height of the flagpole to the nearest foot?

29. Given that  $\cos 83^\circ \approx 0.122$ , write the sine of a complimentary angle.

30. The area of a trapezoid is 128 square feet. If the height of the trapezoid is increased by a factor of 5, what is the area of the new trapezoid?

31. In right triangle HJK,  $\angle J$  is a right angle and  $\tan \angle H = 1$ . Which statement about triangle HJK must be true?

- a.  $\sin \angle H = \frac{1}{2}$  b.  $\sin \angle H = 1$   
 c.  $\sin \angle H = \cos \angle H$  d.  $\sin \angle H = \frac{1}{\cos \angle H}$

32. A hot air balloon is 1200 feet above the ground. The angle of depression from the basket of the hot air balloon to the base of a monument is  $54^\circ$ . Write an equation to find the distance,  $d$ , in feet, from the basket of the hot air balloon to the base of the monument.

33. Describe the transformations to the parent graph for each of the following:

- a.  $y = 2(x+4)^2 - 5$
- b.  $y = (-1/2x)^2$
- c.  $y = -2^x - 1$
- d.  $y = \frac{1}{2}x^{-3}$

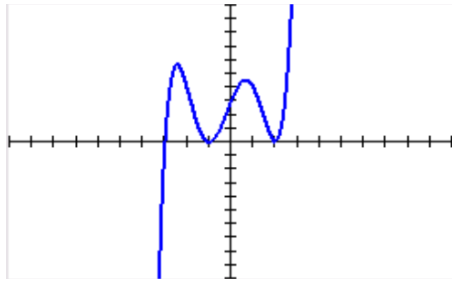
34. Find the average rate of change of  $f(x) = 5x^2 - x + 4$  from:

- a.  $[0, 1]$  and b.  $x = 1$  to  $x = 2$ .

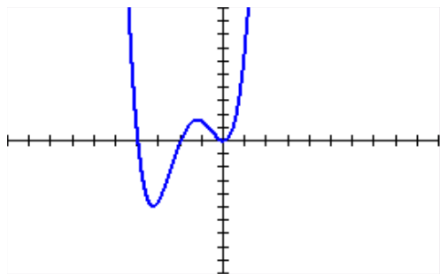
**Characteristics of Functions – For #35-37, state the:**

- a. Domain and Range
- b. Zeros
- c. Intercepts
- d. Intervals of increase and decrease
- e. Extrema (max and min values)
- f. End behavior
- g. Positive and negative intervals

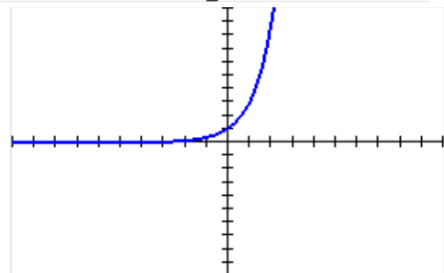
35.



36.



37.



38. Simplify the following **WITHOUT** using a calculator.

a.  $(\sqrt{3})(1 + \sqrt{12})$       b.  $\frac{4}{5\sqrt{2}}$       c.  $\sqrt{2} * \sqrt{18}$

d.  $\sqrt{48x^8}$       e.  $\sqrt{\frac{9}{24}}$       f.  $\sqrt{12} * \sqrt{15}$

g.  $3\sqrt{7} - 4\sqrt{11} + \sqrt{28} - 3\sqrt{44}$       h.  $-5\sqrt{2} + 4\sqrt{50}$

39. Simplify each expression, assuming that no variable equals zero. Write your answer using **positive exponents**.

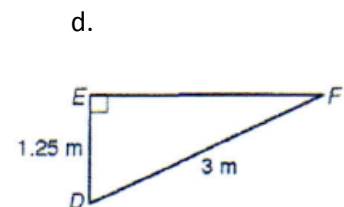
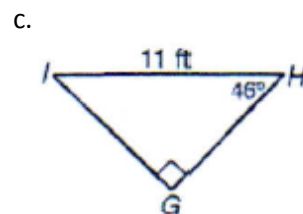
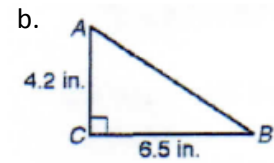
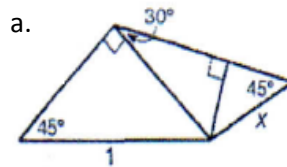
a.  $x^5x^{-11}$       b.  $(p^{-4})^2$       c.  $25^0$       d.  $\frac{y^{-7}}{y^{-3}}$

e.  $(4xy^5)(5x^4y^8z)$       f.  $\left(\frac{3x^{-1}y^4}{5x^5y^{-2}}\right)^3$

g.  $(7x^3)^2(-x^{-2})^{-5}$       h.  $\left(\frac{2m}{n^4m^{-3}}\right)^3 * \left(\frac{m^6n^5}{m^2n^{-2}}\right)^{-4}$

i.  $(5ab^7c^3)^{-2} * \left(\frac{-a^{-7}b^{-2}}{2(b^2c^3)^3}\right)^3$

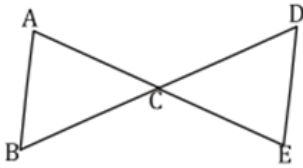
40. In the following triangles, find all missing side and angle measures:



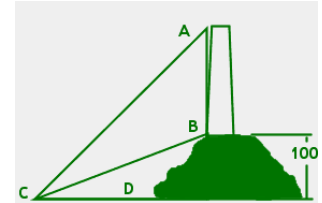
41. Describe, in detail, each steps for constructing an equilateral triangle inscribed in a circle.

46. A lighthouse stands on a hill 100 m above sea level. If  $\angle ACD$  measures  $60^\circ$  and  $\angle BCD$  is  $30^\circ$ , find the height of the lighthouse.

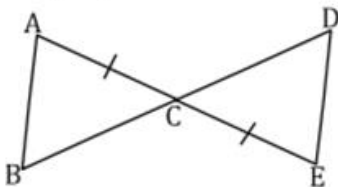
42. Given:  $\overline{AE}$  Bisects  $\overline{BD}$ ,  $\angle B \cong \angle D$



Prove:  $\triangle ABC \cong \triangle EDC$

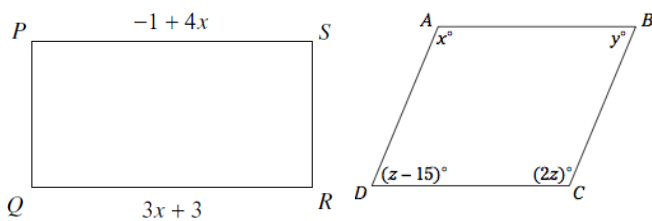


43. Given  $\overline{AB} \parallel \overline{ED}$ ,  $\overline{AC} \cong \overline{EC}$



Prove:  $\triangle ABC \cong \triangle EDC$

44. Find the missing value in each parallelogram.

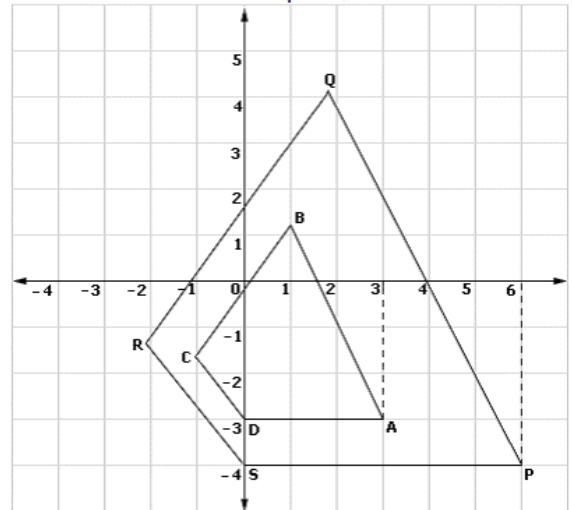


45. Given the graph  $f(x) = 3x^2 + 6x$ . Which of the following statements is **not true**?

- The range is the set of all real numbers greater than or equal to 3.
- The function is decreasing on the interval  $\{-\infty < x < -1\}$
- The zeros are -1 and 0
- The vertex is at (-1, 3)

Find the scale factor that maps PQRS onto ABCD.

47. a)



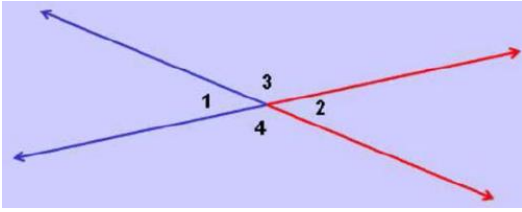
b) What is the center of dilation?

48. An observer in a 50-foot tall lighthouse spots a ship in distress at an angle of depression of  $10.5^\circ$ . How far is the ship from shore?

49. In quadrilateral WXYZ,  $\angle W \cong \angle Y$ . Which information would help to prove that WXYZ is a parallelogram?

- $WY = XZ$
- $\angle X \cong \angle Z$
- $\angle X \cong \angle W$
- $\overline{WY} \cong \overline{XZ}$

50. Describe a sequence of two transformations to map  $S(-2, -2)$ ,  $T(-5, -6)$ ,  $U(-6, -6)$ ,  $V(-6, -5)$  onto its image  $S'(6, 3)$ ,  $T'(2, 6)$ ,  $U'(2, 7)$ ,  $V'(3, 7)$ .



51. Use the figure above to fill in the blanks to complete the proof that  $m\angle 1 \cong m\angle 2$

$m\angle 1 + m\angle 3 = \underline{\hspace{2cm}}^\circ$  because the \_\_\_\_\_ postulate

$m\angle 2 + m\angle 3 = \underline{\hspace{2cm}}^\circ$  because the \_\_\_\_\_ postulate

Use \_\_\_\_\_ and set the two equations equal to each other

$$m\angle 2 + m\angle 3 = m\angle 1 + m\angle 3$$
$$\underline{-m\angle 3} \qquad \underline{-m\angle 3}$$

So \_\_\_\_\_

Therefore:  $\underline{\hspace{2cm}} \cong \underline{\hspace{2cm}}$

52. Write the standard form equation for the quadratic function  $y = (2x - 7)^2$ .

53. State the range of the equation  $f(x) = x^2 - 2x - 6$ .

54. Determine whether  $16x^2 - 24x + 9$  is a perfect square trinomial. If so, factor it. If not, explain why.

55. Identify the zeros of the function **WITHOUT** a calculator.  $f(x) = 3x^2 - 26x + 16$

56. Identify the x and y intercepts of the function  $g(x) = \frac{1}{2}(x - 1)^2 - 6$ . (Do NOT write answers with decimals)

57. Convert the equation to vertex form:  $y = 2x^2 - 8x - 5$

58. Completely factor the following expressions:

a.  $4x^2 - 36$     b.  $x^4 - 16$     c.  $4x^2 - 12x - 16$

d.  $25x^2 + 50$     e.  $6x^2 - 8x - 8$     f.  $6x^2 + 9x + 27$

59. The height of in feet of a rocket launched from the ground can be modeled by the function,  $h(t) = -16t^2 + 96t$ , where t is the time in seconds after it is launched. How long does it take for the rocket to reach its maximum height?

60. Write the function  $f(x) = -\frac{1}{4}(x + 6)^2 + 4$  in standard form.

61. What is the axis of symmetry of the function  $f(x) = -5x^2 + 4x + 2$ ?

62. Which equation has exactly one solution?

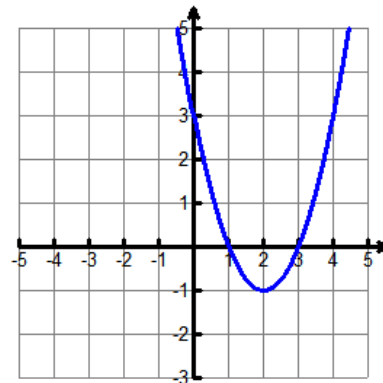
a.  $3x^2 + 3x - 6 = 0$       b.  $4x^2 + 12x + 8 = 0$

c.  $9x^2 + 24x + 16 = 0$     d.  $3x^2 - 18x + 15 = 0$

63. The quadratic equation,  $ax^2 + 3x - 1 = 0$  has a discriminant of -15. What is the value of a?

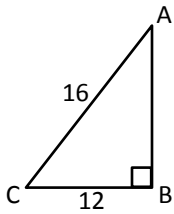
64. Complete the square to write  $c(x) = x^2 - 14x + 50$  in vertex form.

65. What is the equation of the parabola in standard form?

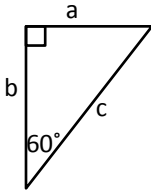


66. Given the function  $f(x) = -\frac{1}{2}(x - 5)^2$  is graphed on a coordinate grid. List all transformations when compared to the parent function  $f(x) = x^2$ .

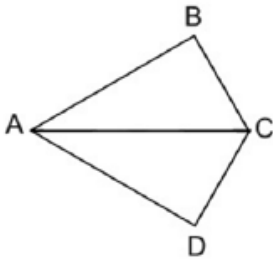
67. What is the measure of  $\angle A$  to the nearest degree?



68. If  $a = 6$ , then the exact value of  $b$  is . . .



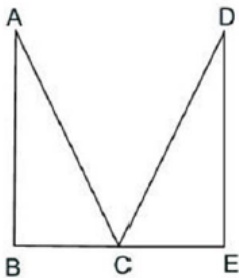
69. Given  $\overline{AC}$  bisects  $\angle BAD$  and  $\angle BCD$ : Which of the following methods can be used to prove  $\triangle ABC \cong \triangle ADC$ ?



- a. SAS    b. ASA    c. SSA    d. Not enough information

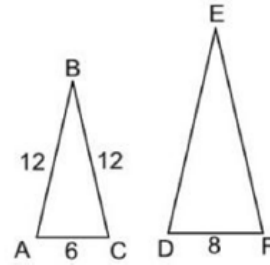
70. At a certain time of the day, the shadow of a 4' boy is 6' long. The shadow of a nearby flagpole at the same time of day is 30' long. How tall is the flagpole?

71. Given  $\overline{AC} \cong \overline{DE}$  and  $\angle A \cong \angle D$ . Which of the following methods can be used to prove  $\triangle ABC \cong \triangle DEC$ ?



- a. SAS    b. ASA    c. SSS    d. Not enough information

72. In the accompanying diagram,  $\triangle ABC \cong \triangle DEF$ ,  $AC = 6$ ,  $AB = BC = 12$ , and  $DF = 8$ . Find the perimeter of  $\triangle DEF$ .

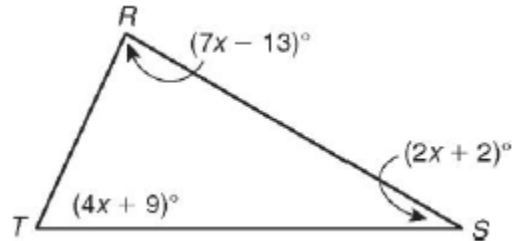


73. Angle J and angle K are complementary angles in a right triangle. The value of  $\tan J$  is  $\frac{13}{7}$ . What is the value of  $\sin J$ ?

74. A man is standing on the top of a platform that is 245 feet tall. The man measures the angle of depression to a nearby tree to be  $32^\circ$ . How far is the tree from the base of the platform?

75. Which trigonometric function is equal to  $\cos 61^\circ$ ?

76. Solve for  $x$  and then find the measure of each angle.



77. Find the measure of  $\angle D$ .

