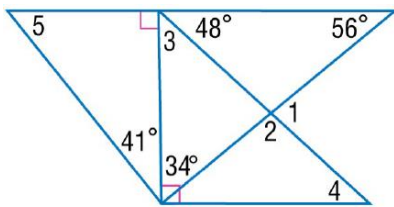
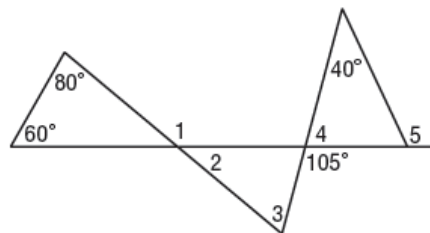


- Is each of the following statements true or false? Explain your reasoning.
 - Every equilateral triangle is acute.
 - A triangle can have two obtuse angles.
 - A triangle can have two acute exterior angles.
 - A triangle can have at most one right angle.
- In $\triangle DEF$, $m\angle D = (12x - 6)^\circ$, $m\angle E = (5x + 2)^\circ$, and $m\angle F = 6x^\circ$. Classify $\triangle DEF$ by its angles.
- A triangle has side lengths of 4 inches, 6 inches, and 8 inches. Classify the triangle by its side lengths.

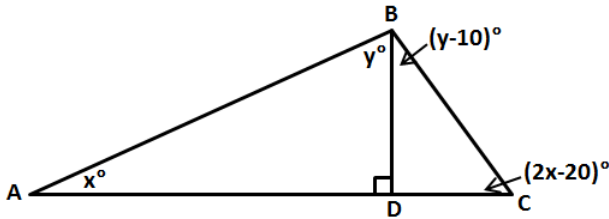
- Using the diagram below, please find the measure of all numbered angles. (NOTE: Diagram not drawn to scale)



- Using the diagram below, please find the measure of the following angles:
 - $m\angle 1$
 - $m\angle 2$
 - $m\angle 3$
 - $m\angle 4$
 - $m\angle 5$

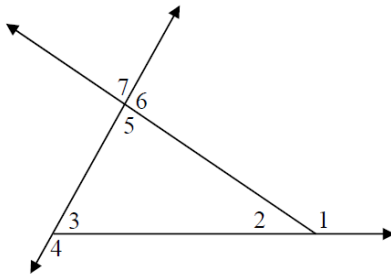


6. Using the diagram below, please solve for x and y.

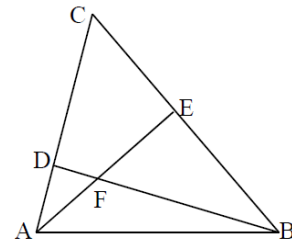


7. In a triangle, the measure of the second angle is four times the measure of the first angle. The third angle is twenty-four less than the first angle. Find the measure of each angle and classify the triangle by its angle measures **and** by its side lengths.

8. Given $m\angle 1 = 112^\circ$ and $m\angle 7 = 69^\circ$, find the measures of the other numbered angles.



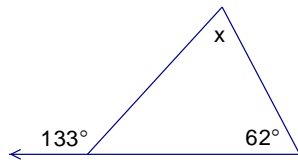
9. In the diagram below, $m\angle CAB = 80^\circ$ and $m\angle CBA = 60^\circ$. If $\overline{BD} \perp \overline{AC}$ and $\overline{AE} \perp \overline{BC}$, find $m\angle ACB$ and $m\angle AFB$.



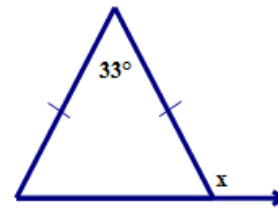
10. One acute angle of a right triangle measures 37° . Find the measure of the other acute angle.

11. Use the diagrams below, please solve for x.

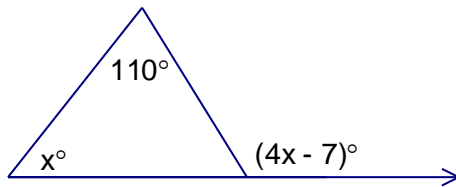
a.



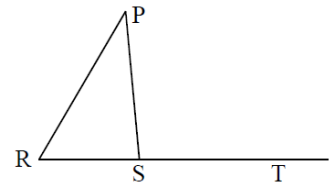
b.



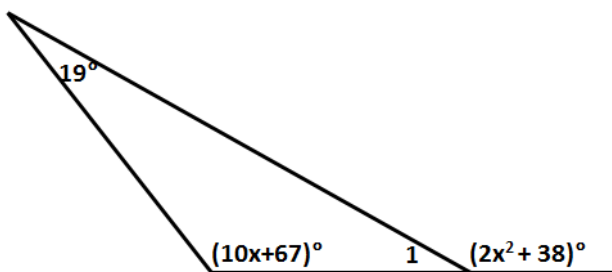
12. Using the diagram below, please find the measure of the exterior angle.



13. If $m\angle PST = (x + 3y)^\circ$, $m\angle RPS = 45^\circ$, $m\angle PRS = 2y^\circ$, and $m\angle PSR = 5x^\circ$, find $m\angle PST$.

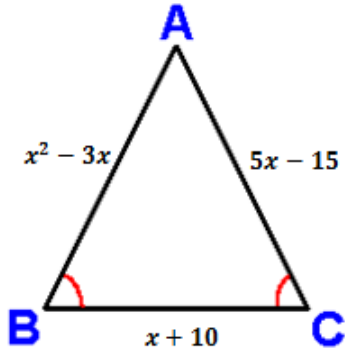


14. Find all possibilities for $m\angle 1$ in the diagram below. (NOTE: Diagram not drawn to scale)

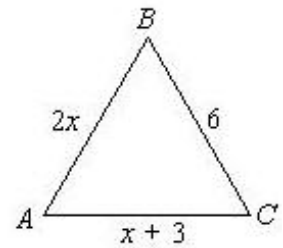


15. Given $\triangle LMN$ is isosceles, \overline{LN} and \overline{LM} are the legs, $LM = 3x - 2$, $LN = 2x + 1$, and $MN = 5x - 2$. Find the value of x and find the perimeter of $\triangle LMN$.

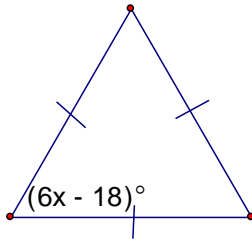
16. Using the diagram below, find the value of x .



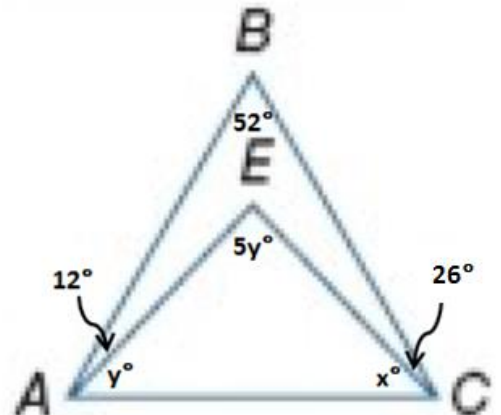
17. Given that $\overline{AB} \cong \overline{BC}$, find the value of x and classify $\triangle ABC$ by its side lengths.



18. Given the diagram below, please find the value of x .

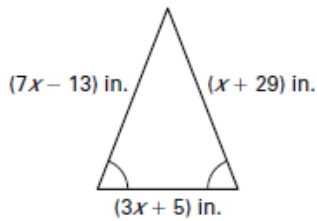


19. Given the information listed in the diagram below, $m\angle BAE = 12^\circ$, $m\angle ABC = 52^\circ$, and $m\angle BCE = 26^\circ$, please find the values of x and y .



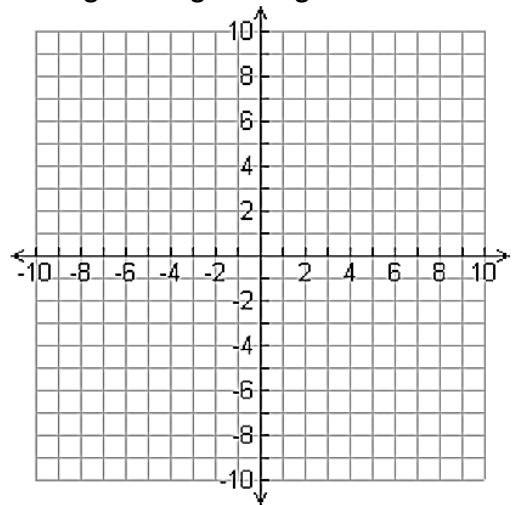
20. $\triangle FGH$ is equilateral with $FG = x + 5$, $GH = 3x - 9$, and $FH = 2x - 2$. Find the perimeter of $\triangle FGH$.

21. Using the diagram below, please find perimeter of the triangle.

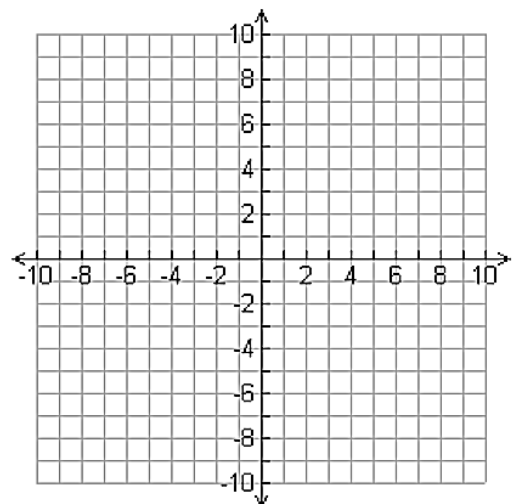


A triangle has the given vertices. Graph the triangle, find each side length in simplest radical form, and classify the triangle by its side lengths. Determine if the triangle is a right triangle.

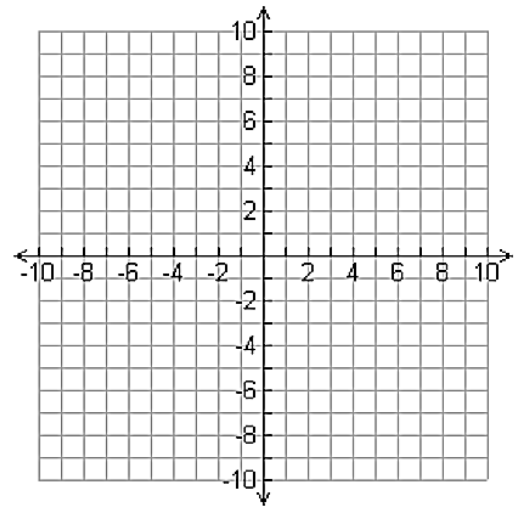
22. $A(-3, 3)$, $B(2, 8)$, $C(7, 3)$



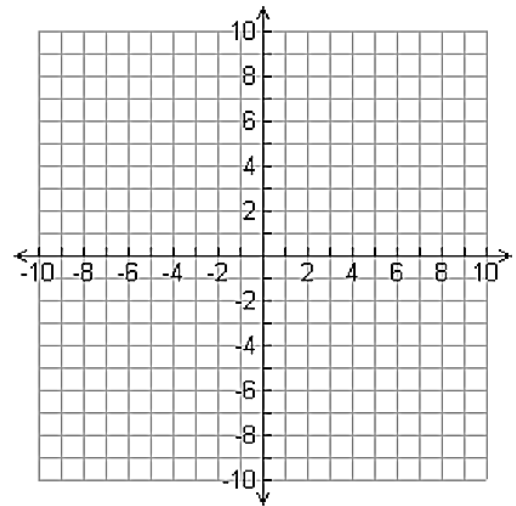
23. $D(1, 1)$, $E(4, 0)$, $F(8, 5)$



24. G(1, -3), H(2, -6), I(-1, -5)



25. J(0, 0), K(6, 0), L(3, $\sqrt{27}$)



Answer Key :

- 1) a. True, each angle in an equilateral triangle is always 60°
 - b. False, if a triangle had more than one obtuse angle, the interior angle sum would be greater than 180°
 - c. False, an angle would have to have two obtuse angles in order to have two acute exterior angles
 - d. True, if a triangle had more than one right angle, the interior angle sum would be greater than 180°
- 2) $x = 8$, right triangle
- 3) Scalene triangle
- 4) $m\angle 1 = 104^\circ$, $m\angle 2 = 76^\circ$, $m\angle 3 = 42^\circ$, $m\angle 4 = 48^\circ$, $m\angle 5 = 49^\circ$
- 5) $m\angle 1 = 140^\circ$, $m\angle 2 = 40^\circ$, $m\angle 3 = 65^\circ$, $m\angle 4 = 75^\circ$, $m\angle 5 = 115^\circ$
- 6) $x = 30$, $y = 60$
- 7) Angles : 34° , 136° , 10° , Obtuse Scalene
- 8) $m\angle 1 = 112^\circ$, $m\angle 2 = 68^\circ$, $m\angle 3 = 43^\circ$, $m\angle 4 = 137^\circ$, $m\angle 5 = 69^\circ$, $m\angle 6 = 111^\circ$, $m\angle 7 = 69^\circ$
- 9) $m\angle ACB = 40^\circ$, $m\angle AFB = 140^\circ$
- 10) 53°
- 11) a. $x = 71$ b. $x = 106.5$
- 12) 149°
- 13) $x = 15$, $y = 30$, $m\angle PST = 105^\circ$
- 14) $m\angle 1 = 14^\circ$, OR $m\angle 1 = 124^\circ$
- 15) $x = 3$, Perimeter = 27 units
- 16) $x = 5$
- 17) $x = 3$, Equilateral
- 18) $x = 13$
- 19) $x = 72$, $y = 18$
- 20) $P = 36$ units
- 21) $P = 98$ inches
- 22) Right Isosceles Triangle
- 23) Obtuse Scalene Triangle
- 24) Acute Isosceles Triangle
- 25) Equilateral Triangle