

G.G.69: Triangles in the Coordinate Plane: Investigate, justify, and apply the properties of triangles in the coordinate plane, using the distance, midpoint, and slope formulas

- 1 If the vertices of $\triangle ABC$ are $A(-2, 4)$, $B(-2, 8)$, and $C(-5, 6)$, then $\triangle ABC$ is classified as

1) right
2) scalene
3) isosceles
4) equilateral

- 2 Triangle ABC has vertices $A(0, 0)$, $B(3, 2)$, and $C(0, 4)$. The triangle may be classified as

1) equilateral
2) isosceles
3) right
4) scalene

- 3 Which type of triangle can be drawn using the points $(-2, 3)$, $(-2, -7)$, and $(4, -5)$?

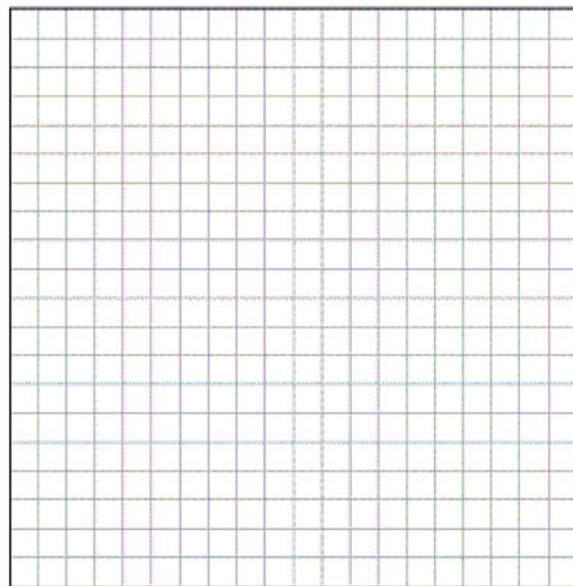
1) scalene
2) isosceles
3) equilateral
4) no triangle can be drawn

- 4 The vertices of $\triangle ABC$ are $A(-1, -2)$, $B(-1, 2)$ and $C(6, 0)$. Which conclusion can be made about the angles of $\triangle ABC$?

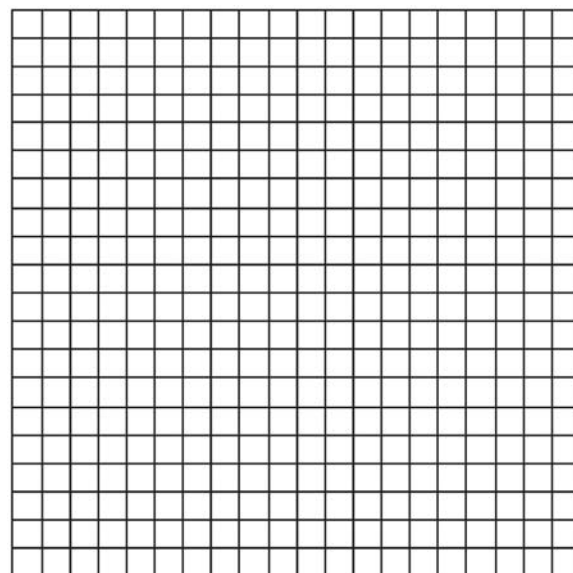
1) $m\angle A = m\angle B$
2) $m\angle A = m\angle C$
3) $m\angle ACB = 90$
4) $m\angle ABC = 60$

- 5 Triangle ABC has vertices at $A(3, 0)$, $B(9, -5)$, and $C(7, -8)$. Find the length of \overline{AC} in simplest radical form.

- 6 Triangle ABC has coordinates $A(-6, 2)$, $B(-3, 6)$, and $C(5, 0)$. Find the perimeter of the triangle. Express your answer in simplest radical form. [The use of the grid below is optional.]



- 7 Given: $J(-4, 1)$, $E(-2, -3)$, $N(2, -1)$
Prove: $\triangle JEN$ is an isosceles right triangle.
[The use of the grid is optional.]



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Answer Section

1 ANS: 3

$$AB = 8 - 4 = 4. BC = \sqrt{(-2 - (-5))^2 + (8 - 6)^2} = \sqrt{13}. AC = \sqrt{(-2 - (-5))^2 + (4 - 6)^2} = \sqrt{13}$$

REF: 011328ge

2 ANS: 2

REF: 061115ge

3 ANS: 2

REF: 081226ge

4 ANS: 1

REF: fall0809ge

5 ANS:

$$\sqrt{(7 - 3)^2 + (-8 - 0)^2} = \sqrt{16 + 64} = \sqrt{80} = 4\sqrt{5}$$

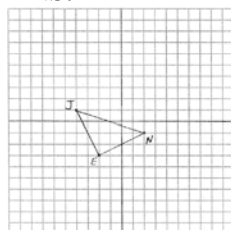
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6 ANS:

$$15 + 5\sqrt{5}$$

REF: 060936ge

7 ANS:



To prove that $\triangle JEN$ is a right triangle, prove that its legs are perpendicular by showing their slopes are opposite reciprocals: $m_{\overline{JE}} = \frac{1 - -3}{-4 - -2} = \frac{4}{-2} = -2$

$$m_{\overline{EN}} = \frac{-3 - -1}{-2 - -2} = \frac{-2}{-4} = \frac{1}{2}$$

To prove that $\triangle JEN$ is an isosceles triangle, prove that its legs are congruent by using the distance formula:

$$d_{\overline{JE}} = \sqrt{(-4 - (-2))^2 + (1 - (-3))^2} = \sqrt{20}$$

$$d_{\overline{EN}} = \sqrt{(-2 - 2)^2 + (-3 - -1)^2} = \sqrt{20}$$

REF: 011029b