

Proving Shapes with Coordinates and Slopes

Grade 10 – Geometry math · Test · Standards: G-GPE.B.4, G-GPE.B.5, G-GPE.B.6, G-GPE.B.7

Name: _____ Date: _____ Class: _____

This test has 8 questions worth 20 points and is designed for 45 minutes. A calculator is allowed. Write exact answers unless a decimal is requested and justify every classification with computed numbers.

Standards: G-GPE.B.4, G-GPE.B.5, G-GPE.B.6, G-GPE.B.7 · **Level:** Grade 10 Geometry

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Distance and Midpoint (2 points)

Segment RS has endpoints $R(-6, 2)$ and $S(3, -4)$. Find its length as an exact simplified radical (1 point) and its midpoint (1 point).

Question 2 Parallel, Perpendicular or Neither (2 points)

Line a passes through $(0, 4)$ and $(6, 0)$. Line b passes through $(-2, -5)$ and $(4, -1)$. Line c passes through $(1, 1)$ and $(3, 4)$. Classify each pair: a and b (1 point); a and c (1 point).

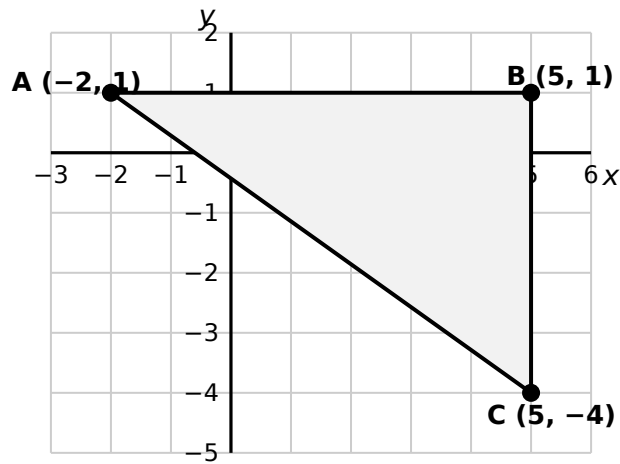
Question 3 Line Through a Point (2 points)

Write, in slope-intercept form, the equation of the line through $(4, -1)$ that is perpendicular to $y = \frac{4}{3}x + 2$.

Question 4 Splitting a Segment (2 points)

Find the point P on segment AB with $A(-6, 3)$ and $B(14, -7)$ so that $AP : PB = 2 : 3$.

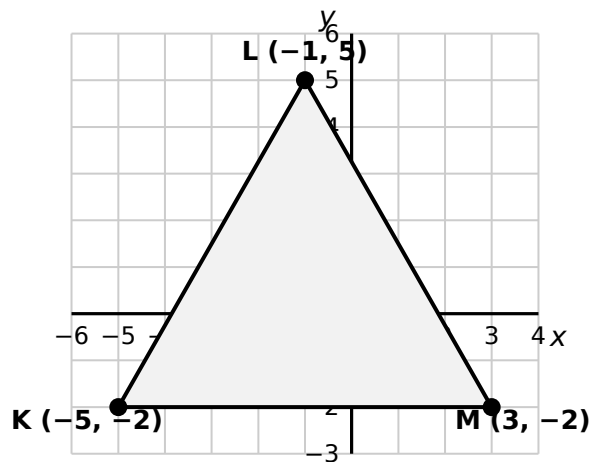
Question 5 Area and Perimeter (3 points)



Triangle ABC.

Find the area (1 point) and the perimeter as an exact expression (2 points).

Question 6 Is It Isosceles? (3 points)



Triangle KLM.

Prove that triangle KLM is isosceles and name the vertex angle.

Question 7 Prove a Parallelogram (3 points)

Prove that $E(-2, 1)$, $F(3, 0)$, $G(6, 4)$ and $H(1, 5)$ are the vertices of a parallelogram by finding the midpoints of both diagonals.

Question 8 Fourth Vertex (3 points)

Three vertices of a parallelogram are $P(0, 0)$, $Q(7, 2)$ and $R(9, 7)$, taken in order. Find the fourth vertex S , and the area of the parallelogram.