

Points, Segments and Angles: Core Definitions

Grade 10 – Geometry math · Test · Standards: G-CO.A.1

Name: _____ Date: _____ Class: _____

Eight questions, 20 points, 45 minutes. Show every equation and label each answer with its unit. No calculators are needed, and the figures are not drawn to scale.

Standards: G-CO.A.1 · **Level:** Grade 10 Geometry

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

Question 1 Reasoning with definitions (2 points)

Decide whether each statement is always, sometimes or never true, and justify briefly.

- Two perpendicular lines form four right angles. (1 point)
- The complement of an angle is larger than the angle. (1 point)

Question 2 Segment addition (3 points)

Point Q lies between P and R . $PQ = 4x - 3$, $QR = 2x + 9$ and $PR = 48$.

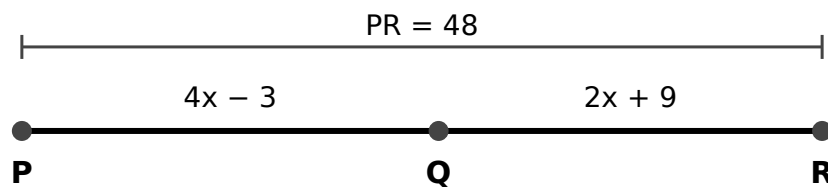


Figure for Question 2.

- Find x . (1 point)
- Find PQ and QR . (2 points)

Question 3 Angle addition (3 points)

Ray OB lies inside $\angle AOC$. $m\angle AOB = (5x - 4)^\circ$, $m\angle BOC = (3x + 12)^\circ$ and $m\angle AOC = 128^\circ$.

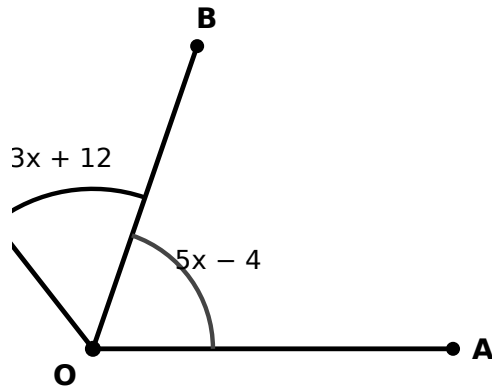


Figure for Question 3.

- Find x . (1 point)
- Find $m\angle AOB$. (1 point)
- Find $m\angle BOC$. (1 point)

Question 4 Complements and supplements (2 points)

Solve each problem.

- Find the complement of a 63.5° angle. (1 point)
- The supplement of an angle is 3 times the angle. Find the angle. (1 point)

Question 5 Vertical angles and linear pairs (3 points)

Two lines intersect at O . $\angle POR = (6x - 10)^\circ$ and its vertical angle $\angle QOS = (4x + 20)^\circ$.

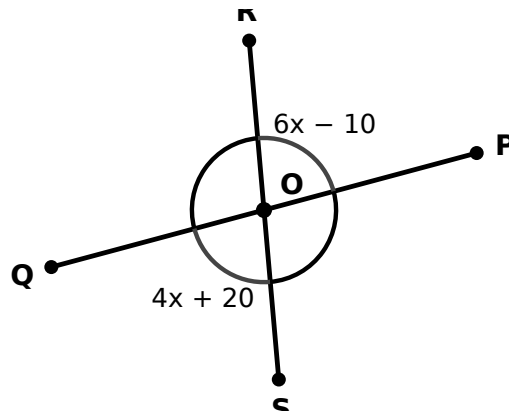


Figure for Question 5.

Question 6 Angle bisector (3 points)

Ray BD bisects $\angle ABC$. $m\angle ABD = (7x - 9)^\circ$ and $m\angle DBC = (4x + 12)^\circ$.

- Find x . (1 point)
- Find $m\angle DBC$. (1 point)
- Find $m\angle ABC$. (1 point)

Question 7 Midpoint coordinate (2 points)

On a number line, P is at -8.5 and Q is at 5.5 . Find the coordinate of the midpoint of PQ and the length PQ .

Question 8 Water station on a trail (2 points)

A straight trail runs from trailhead T to summit S , and $TS = 7.8$ miles. A water station W is at the midpoint of TS . A bench B is 1.15 miles from T on the trail. Find TW and BW .