

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2011
ROUND 3 COORDINATE GEOMETRY OF LINES AND CIRCLES

ANSWERS

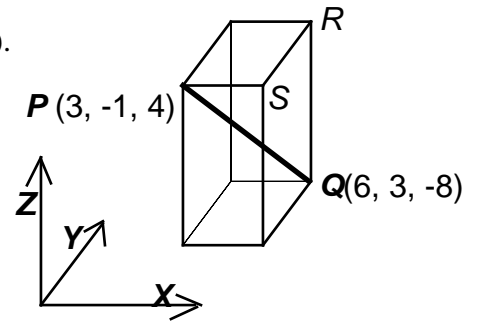
A) _____

B) _____

C) X: (____ , ____) Y: (____ , ____)

- A) A line segment in space has endpoints $P(3, -1, 4)$ and $Q(6, 3, -8)$.
 Compute the length of the line segment.

Hint: Consider triangles PSR and PRQ in the box
 illustrated in the diagram at the right.



- B) Compute the length of a tangent from point $P(4, -3)$ to the circle $C_1: (x + 1)^2 + y^2 = 6$

- C) Given: $\mathcal{L}_1 \parallel \mathcal{L}_2$, $\overline{PQ} \perp \mathcal{L}_1$, $P(7, 11)$, $PQ = 10$ and
 Q is located to the right of point P .
 If $\mathcal{L}_1 = \{(x, y) \mid 3x - 4y + 23 = 0\}$, compute the
 coordinates of the x - and y -intercepts of \mathcal{L}_2 .

