

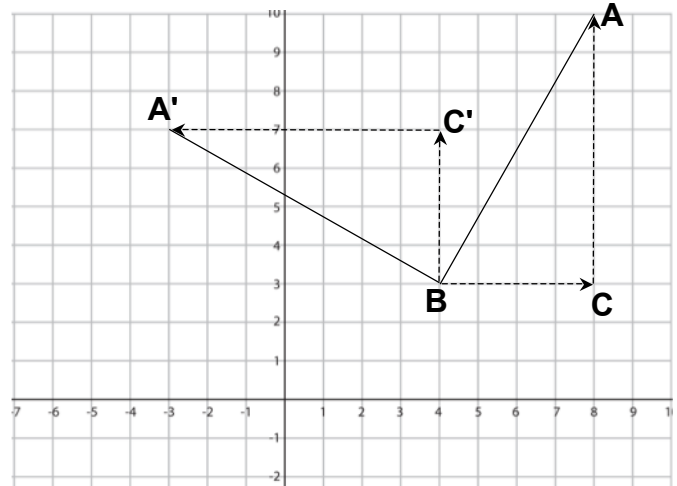
Name _____ Per _____

LO: I can use the Pythagorean Theorem to prove that the slopes of perpendicular lines are opposite reciprocals.

 DO NOW On the back of this packet (1) Proving that lines with opposite reciprocal slopes are perpendicular by rotation

calculator

(a) What transformation maps triangle ABC to triangle A'B'C'?

(b) Because of the transformation, $\overline{A'C'} \perp$ _____, $\overline{B'C'} \perp$ _____, and $\overline{A'B'} \perp$ _____

(c) Vector BC is the run (+) of triangle ABC and maps to B'C' which is the _____ (+) of triangle A'B'C'.

Vector CA is the rise (+) of triangle ABC and maps to A'C' which is the _____ (-) of triangle A'B'C'.

 (2) The converse of the Pythagorean Theorem

calculator

(a) If a triangle is a right triangle, then the sides are related by the formula _____.

Conversely, if the sides of a triangle are related by the formula $a^2 + b^2 = c^2$,

then the triangle is a _____

(b) Is a triangle with sides 6, 7, and 9 a right triangle? Provide sufficient evidence to support your claim.

(3)
calculator

Proving that lines with opposite reciprocal slopes are perpendicular by Pythagorean Theorem

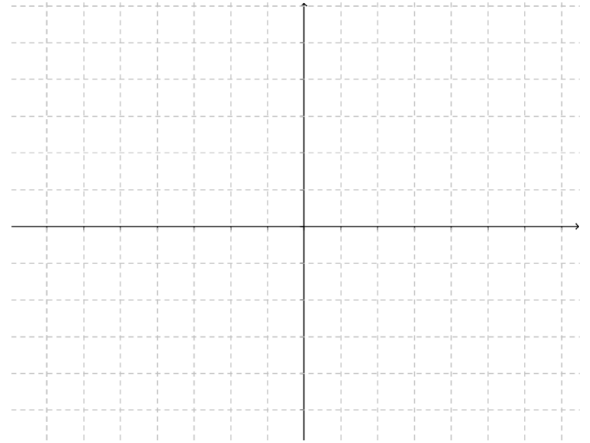
(a)

Use the grid at the right.

- a. Plot points $O(0,0)$, $P(3,-1)$, and $Q(2,3)$ on the coordinate plane.

- b. Determine whether \overline{OP} and \overline{OQ} are perpendicular. Support your findings.

To do part (b), we will determine whether or not \overline{OP} and \overline{OQ} are the two shorter sides of the triangle and then determine whether or not triangle OPQ is a right triangle.



OP

OQ

PQ

(0,0) (3,-1)

(0,0) (2,3)

(3,-1) (2,3)

- (b) Given points $X(-5, -3)$, $Y(2, -4)$ and $Z(3,0)$, are XY and XZ perpendicular? Answer using part (a).

(4)
calculator

Proving that lines with opposite reciprocal slopes are perpendicular by Pythagorean Theorem

Prove using the Pythagorean theorem that \overline{AC} is perpendicular to \overline{AB} given $A(-2, -2)$, $B(5, -2)$, and $C(-2, 22)$.

(5)
calculator

Coordinate Grids: What can we prove with distance (length) and slope?

The points $O(0,0)$, $A(-4,1)$, $B(-3,5)$, and $C(1,4)$ are the vertices of parallelogram $OABC$. Is this parallelogram a rectangle? Support your answer.



(5)
calculator**Exit Ticket**

ON THE LAST PAGE

 (6)
calculator**Homework****Provide sufficient evidence for each response.** (1)

Given points $O(0, 0)$, $S(2, 7)$, and $T(7, -2)$, where \overline{OS} is perpendicular to \overline{OT} , will the images of the segments be perpendicular if the three points O , S , and T are translated four units to the right and eight units up? Explain your answer.

 (2)

A robot that picks up tennis balls is on a straight path from $(8, 6)$ towards a ball at $(-10, -5)$. The robot picks up a ball at $(-10, -5)$, then turns 90° right. What are the coordinates of a point that the robot can move towards to pick up the last ball?

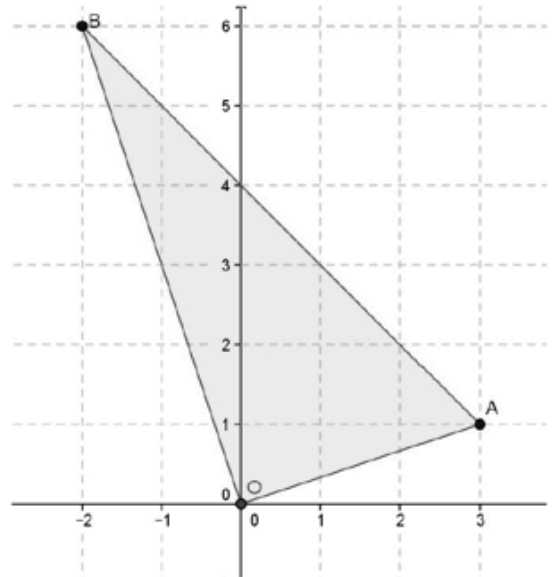
 (3)

Gerry thinks that the points $(4, 2)$ and $(-1, 4)$ form a line perpendicular to a line with slope 4. Do you agree? Why or why not?

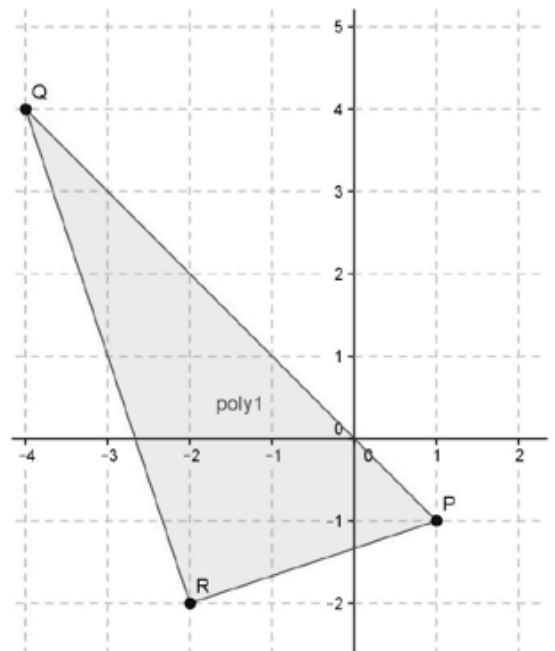
Exit Ticket Name _____ Date _____ Per _____ 8.4R

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

1. Given points $O(0, 0)$, $A(3, 1)$, and $B(-2, 6)$, prove \overline{OA} is perpendicular to \overline{OB} .



2. Given points $P(1, -1)$, $Q(-4, 4)$, and $R(-2, -2)$, prove \overline{PR} is perpendicular to \overline{QR} without the Pythagorean theorem.



A triangle has side lengths 10, 6, and 8. Is the triangle a right triangle? What might you do to check to see if it is a right triangle?

(2) What about the cartoon below is supposed to make people smile?

