LESSON MAKER PRO

Circle Point Quest

Find exact coordinates from reference angles.

HIGH SCHOOL · PC.T.1.5

PC.T.1.5 "Use reference angles to determine the terminal point P (x, y) on the unit circle for a given angle."

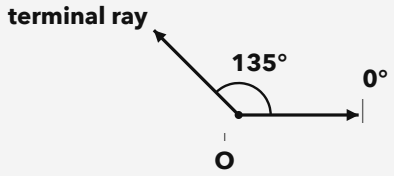
NAME _____ DATE _____

FIND THE REFERENCE ANGLE

A reference angle is the acute angle between an angle's terminal ray and the x-axis. Use it to find the coordinate magnitudes on the unit circle. Then choose the signs of x and y from the quadrant.

WORKED EXAMPLE

Find the terminal point P for the angle shown.



1. 135° is in Quadrant II.
2. Reference angle: 180° - 135° = 45°.
3. At 45°, both coordinate magnitudes are sqrt(2)/2.
4. In Quadrant II, x is negative and y is positive.

Answer: P = (-sqrt(2)/2, sqrt(2)/2)

PRACTICE 4 problems

1 Find P for 210°.

ANSWER _____

2 Find P for 225°.

ANSWER _____

3 Find P for 300°.

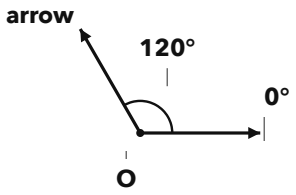
ANSWER _____

4 Find P for 315°.

ANSWER _____

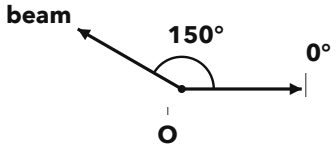
APPLY IT Show your work

1 A game compass turns counterclockwise from 0° to the arrow shown. Find the arrow's unit-circle point P.



ANSWER _____

2 A stage light turns counterclockwise from 0° to the beam shown. Find the beam's unit-circle point P.



ANSWER _____

CHALLENGE One step up

Find P for 765°. Explain how you used a coterminal angle.

WORK SPACE AND ANSWER

ANSWER KEY # Circle Point Quest

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find P for 210°.	**P = (-sqrt(3)/2, -1/2)**
2	Find P for 225°.	**P = (-sqrt(2)/2, -sqrt(2)/2)**
3	Find P for 300°.	**P = (1/2, -sqrt(3)/2)**
4	Find P for 315°.	**P = (sqrt(2)/2, -sqrt(2)/2)**

PART 2 · APPLY IT

1. **P = (-1/2, sqrt(3)/2)** The reference angle is 60°. In Quadrant II, x is negative and y is positive.
2. **P = (-sqrt(3)/2, 1/2)** The reference angle is 30°. In Quadrant II, x is negative and y is positive.

CHALLENGE

765° - 720° = 45°, so 765° is coterminal with 45°. Its terminal point is P = (sqrt(2)/2, sqrt(2)/2).

Accept equivalent exact coordinate forms. Do not accept decimal approximations.