BOARD PROBLEMS Ch. 18

CONVERT TO RECTANGULAR COORDINATES.

1) $r = 2\cos\theta + 2\sin\theta$

CONVERT TO POLAR COORDINATES

2) $y = \frac{x^2}{5}$

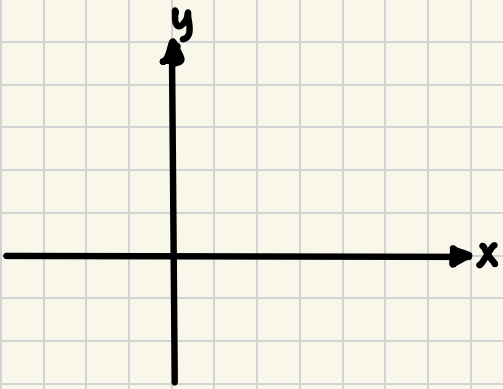
.

SOLVE BY Completing THE SQUARE

3) $2x^2 + 79 = -18x$

4) Convert #3 To vertex FORM

Ex. 1 - If I threw a frisbee (100', 25°), then walked to the spot by walking along the x-axis, then along the y-axis. How far did I travel on each axis?



$x =$ _____

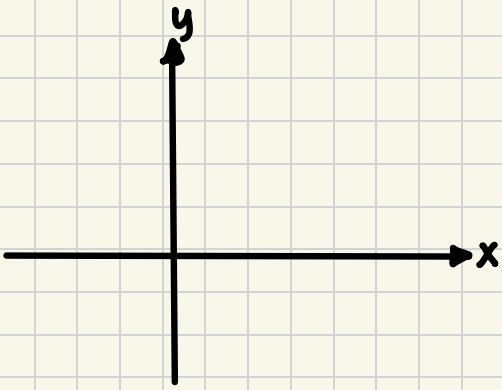
$y =$ _____

VECTOR FORM (

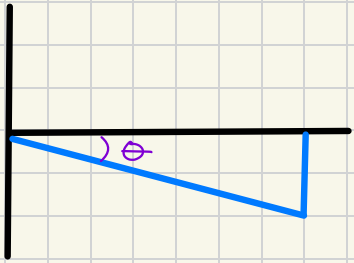
OR IN SAXON OR OTHER TEXTS (

ADDITION OF VECTORS

After throwing the frisbee (100', 25°), then walking to that place, I threw a frisbee again, (80',-45°). Where did the frisbee land?



PUT ANSWER INTO POLAR COORDINATES.

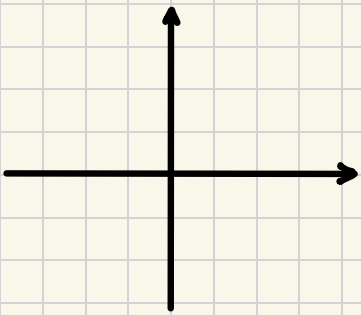


PROCESS REVIEW

1) Change POLAR COORDINATES → VECTORS
2) Add VECTORS
3) Change answer back to POLAR COORDINATES

EX. 3

Ethan throws a frisbee twice. 1st (-138',60°), 2nd (142', 115°)



Adding the x and y components:

$$\begin{array}{r} -69x - 119.5y \\ -60x + 128.7y \\ \hline -129x + \ \ 9.2y \end{array}$$

$(-129x + 9.2y)$

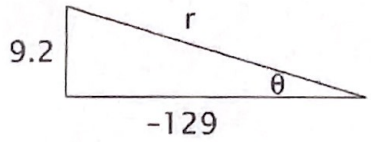
The vector form tells you at once that the resultant is in the second quadrant. Solving for tan with the absolute values of x and y gives the reference angle. Use the reference angle and quadrant to find the angle to use for the polar coordinates.

$$\tan\theta = \frac{9.2}{129} \qquad r^2 = (129)^2 + (9.2)^2$$

$$\theta = 4.08^\circ \qquad r^2 = (16{,}641) + (84.64)$$

$$180^\circ - 4.08^\circ = 175.92^\circ \qquad r = 129.33'$$

Figure 10



One throw (129.33', 175.92°)

Practice Problems 1

Find the polar coordinates of the addition of the two vectors (throws) or the resultant vector (one throw). Round to tenths.

1. First throw: (12, 50°), second throw: (-16, -23°)
   Remember, this is like a backwards toss!

2. First throw: (50, 128°), second throw: (92, -139°)

3. First throw: (27, 325°), second throw: (34, 65°)

4. If the first vector (first throw) was (8, 200°) and the resultant vector (one throw) was (11, 310°), what were the coordinates of the second vector (second throw)? Hint: Instead of adding the first and second vectors to get the resultant vector, subtract the the first vector from the resultant to get the second. Compare your answer with the picture and what you thought it would be.