

The letters x and y represent rectangular coordinates. Write the equation using polar coordinates (r, θ) .

1) $y^2 = 16x$

A) $r^2 \sin^2 \theta = 16 \cos \theta$

B) $r \sin^2 \theta = 16 \cos \theta$

C) $\sin^2 \theta = 16r \cos \theta$

D) $\sin^2 \theta = 16r^2 \cos \theta$

The rectangular coordinates of a point are given. Find polar coordinates for the point.

2) $(-2, 1.3)$ Round your answer to two decimal places, if necessary.

A) $(-2.39, 0.99)$

B) $(2.39, 2.57)$

C) $(2.39, -0.99)$

D) $(2.39, 0.99)$

Write the expression in the standard form $a + bi$.

3) $[2(\cos 15^\circ + i \sin 15^\circ)]^3$

A) $3 + 3i$

B) $4\sqrt{2} + 4\sqrt{2}i$

C) $4 + 4i$

D) $3\sqrt{2} + 3\sqrt{2}i$

Find the unit vector having the same direction as \mathbf{v} .

4) $\mathbf{v} = 3\mathbf{i} + \mathbf{j}$

A) $\mathbf{u} = \frac{3}{\sqrt{10}}\mathbf{i} + \frac{1}{\sqrt{10}}\mathbf{j}$

B) $\mathbf{u} = 3\sqrt{10}\mathbf{i} + \sqrt{10}\mathbf{j}$

C) $\mathbf{u} = \frac{\sqrt{10}}{3}\mathbf{i} + \sqrt{10}\mathbf{j}$

D) $\mathbf{u} = \frac{3}{\sqrt{11}}\mathbf{i} + \frac{1}{\sqrt{11}}\mathbf{j}$

Find the indicated quantity.

5) If $\mathbf{v} = 8\mathbf{i} + \mathbf{j}$ and $\mathbf{w} = -8\mathbf{i} + \mathbf{j}$, find $\|\mathbf{v} + \mathbf{w}\|$.

A) 7

B) $\sqrt{130}$

C) 16

D) 2

Find the angle between \mathbf{v} and \mathbf{w} . Round your answer to one decimal place, if necessary.

6) $\mathbf{v} = -5\mathbf{i} + 7\mathbf{j}$, $\mathbf{w} = -6\mathbf{i} - 4\mathbf{j}$

Solve the problem.

7) A person is pulling a freight cart with a force of 56 pounds. How much work is done in moving the cart 20 feet if the cart's handle makes an angle of 33° with the ground?

Find a rectangular equation for the plane curve defined by the parametric equations.

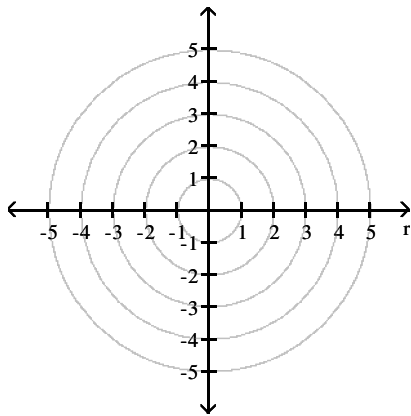
8) $x = 2t - 1$, $y = t^2 + 1$; $-4 \leq t \leq 4$

Write the vector \mathbf{v} in the form $a\mathbf{i} + b\mathbf{j}$, given its magnitude $\|\mathbf{v}\|$ and the angle α it makes with the positive x -axis.

9) $\|\mathbf{v}\| = 4$, $\alpha = 135^\circ$

Graph the polar equation.

10) $r = 1 + \cos \theta$



Transform the polar equation to an equation in rectangular coordinates.

11) $r \sec \theta = -6$

Extra Credit 5 points: Given the complex numbers z and w , find zw . Leave your answer in polar form.

12) $z = 8\left(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6}\right)$, $w = 3\left(\cos \frac{\pi}{2} + i \sin \frac{\pi}{2}\right)$

Find zw .