

Trig 9.3

Convert between polar and rectangular coordinates

Quiz 9.1-9.2

rectangular coordinates

polar coordinates

cosine

sine

<http://mathworld.wolfram.com/Rose.html>

hypotenuse

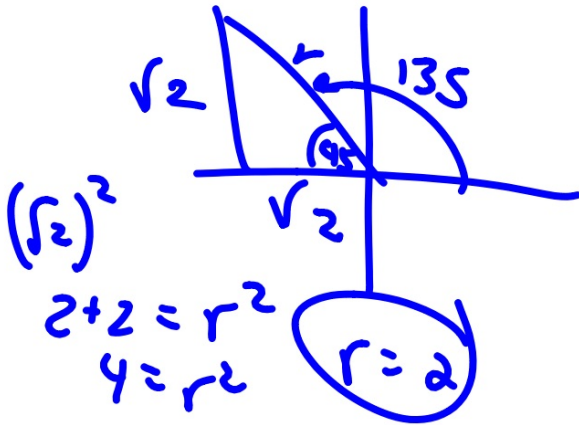
tangent, inverse tangent

Whiteboards

$$\left(2, \frac{3\pi}{4}\right)$$

Find the polar coordinates of each point with the given rectangular coordinates.
Use $0 \leq \theta < 2\pi$ and $r \geq 0$.

5. $(-\sqrt{2}, \sqrt{2})$ $(2, 135^\circ)$ 6. $(-2, -5)$



$$\tan^{-1}\left(\frac{\sqrt{2}}{\sqrt{2}}\right)$$

$$\tan^{-1}(1)$$

Tiny little parking lot...

$$y = r \sin \theta$$

$$x = r \cos \theta$$

$$\underbrace{x^2 + y^2}_{\text{wavy}} = r^2$$

rectangular: x's y's

polar: r's sin cos

5 Write the rectangular equation $(x - 3)^2 + y^2 = 9$ in polar form.

$$(x^2 - 6x + 9) + y^2 = 9$$

$$\frac{r^2}{r} - \frac{6r \cos \theta}{r} = \frac{0}{r}$$

$$r - 6 \cos \theta = 0$$
$$r = 6 \cos \theta$$

tiny little parking lot

Write each rectangular equation in polar form.

9. $y = 2$

10. $x^2 + y^2 = 16$

Write each polar equation in rectangular form.

$$\sec = 1/\cos$$

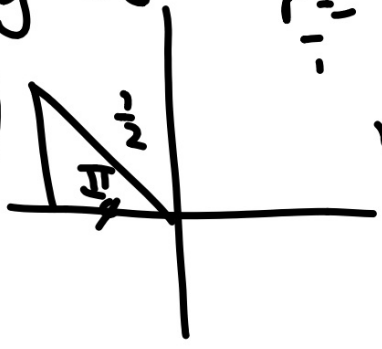
11. $r = 6$

$$r^2 = 36$$
$$x^2 + y^2 = 36$$

12. $r = -\sec \theta$

$$r = -\frac{1}{\cos \theta}$$

$$\left(\frac{1}{2}, \frac{3\pi}{4} \right)$$



$$r \cos \theta = -1$$
$$x = -1$$

WB 9.3