

polar to rectangular

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		2										
2	θ		-210										
3													
4													
5													
6													

this point has radius =2

the angle that is formed with the positive x axis is in degrees -210° or in radians $\frac{-7 \cdot \pi}{6}$

Polar coordinates

$$(2, -210^\circ) \text{ or } (2, \frac{-7 \cdot \pi}{6})$$

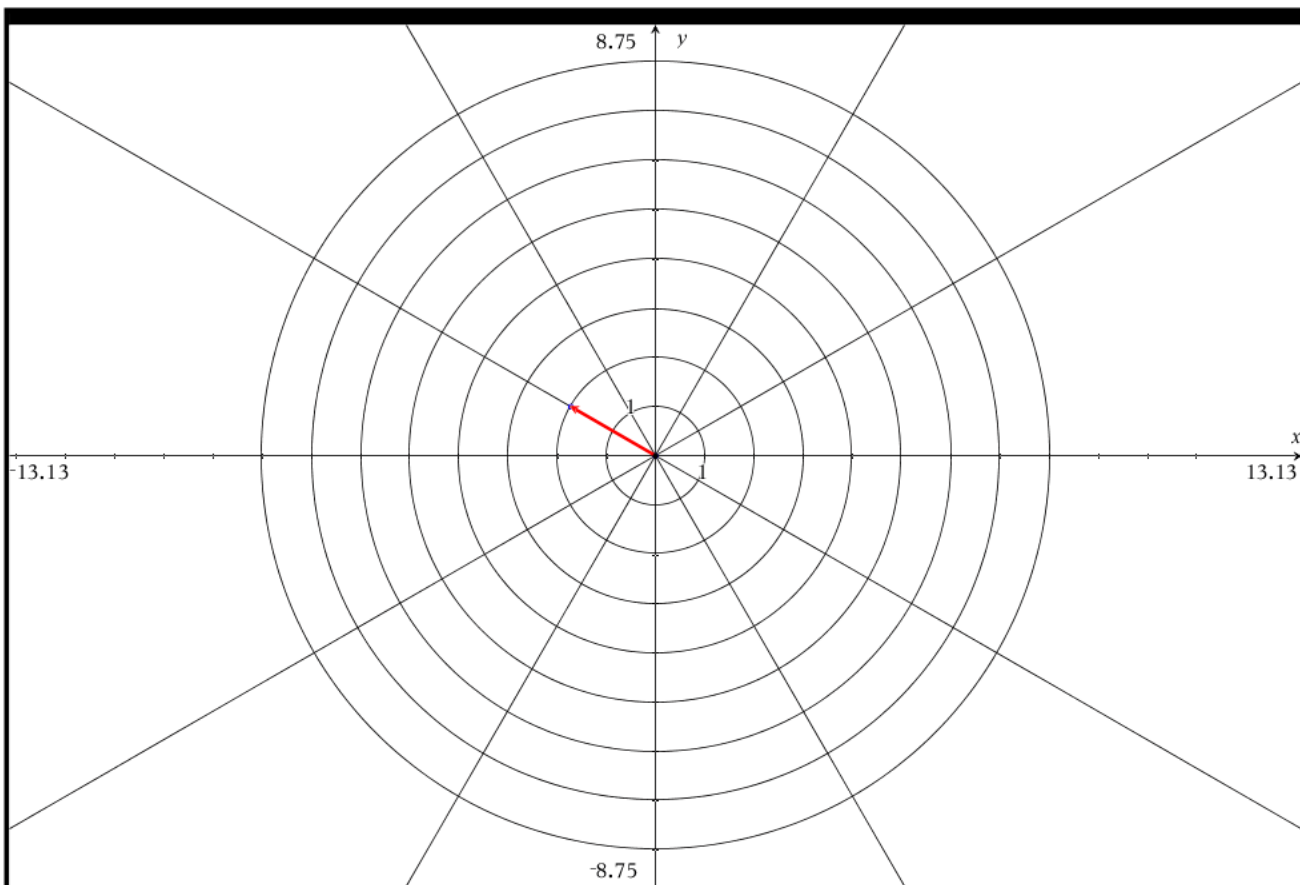
$$(2, 150^\circ) \text{ or } (2, \frac{5 \cdot \pi}{6})$$

Rectangular coordinates

$$(2 \cos(-210), 2 \sin(-210)) \text{ or } (2 \cos(\frac{-7 \cdot \pi}{6}), 2 \sin(\frac{-7 \cdot \pi}{6}))$$

$$(2 \cdot \frac{-\sqrt{3}}{2}, 2 \cdot \frac{1}{2}) \text{ or } (-\sqrt{3}, 1)$$

$$\approx (-1.73205, 1.)$$



polar to rectangular

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		3										
2	θ		-125										
3													
4													
5													
6													

this point has radius =3

the angle that is formed with the positive x axis is in degrees -125° or in radians $\frac{-25 \cdot \pi}{36}$

Polar coordinates

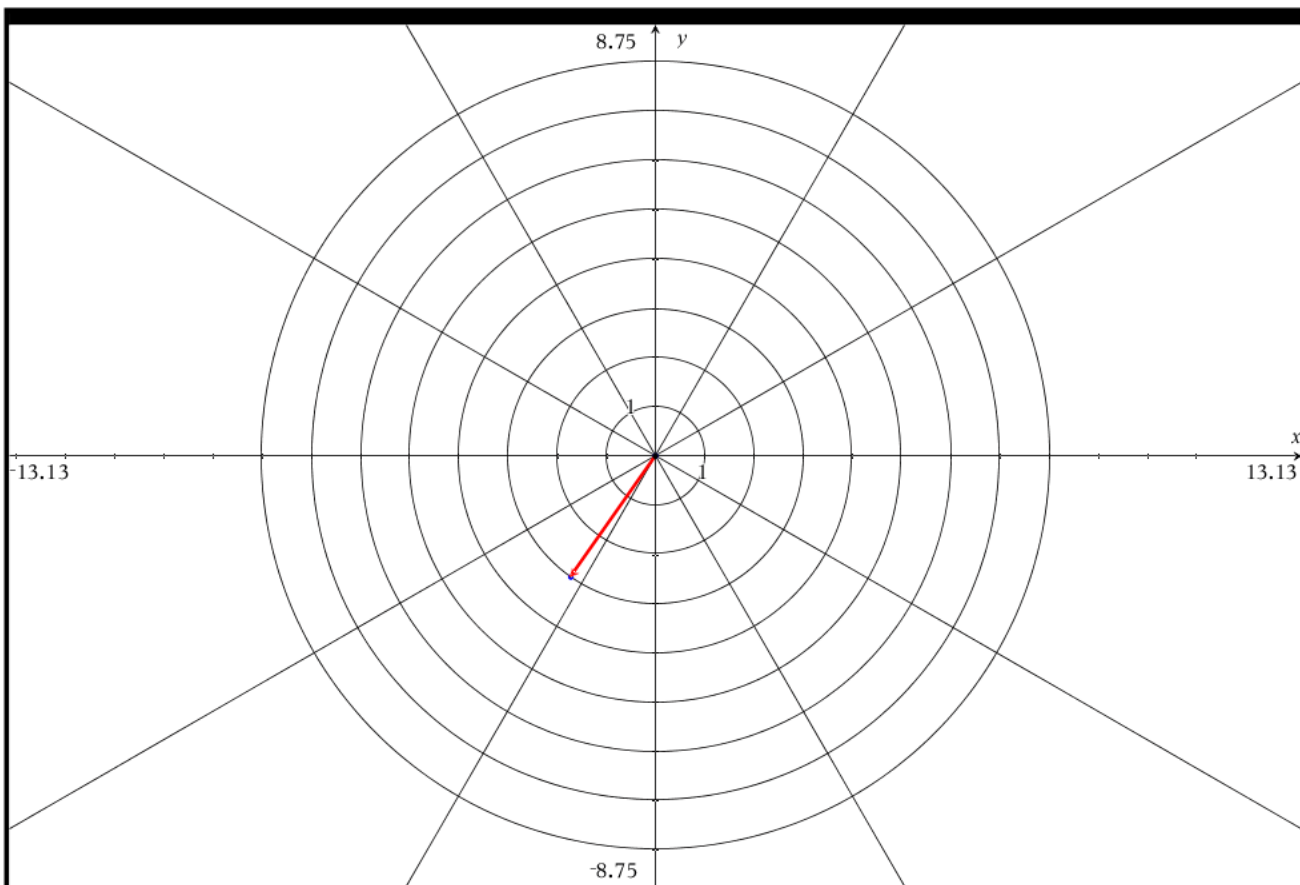
$$(3, -125^\circ) \text{ or } (3, \frac{-25 \cdot \pi}{36})$$

$$(3, 235^\circ) \text{ or } (3, \frac{47 \cdot \pi}{36})$$

Rectangular coordinates

$$(3 \cos(-125), 3 \sin(-125)) \text{ or } (3 \cos(\frac{-25 \cdot \pi}{36}), 3 \sin(\frac{-25 \cdot \pi}{36}))$$

$$\approx (-1.72073, -2.45746)$$



polar to rectangular

	A	B	C	D	E	F	G	H	I	J	K	L	M
=													
1	radius		4										
2	θ		74										
3													
4													
5													
6													

this point has radius =4

the angle that is formed with the positive x axis is in degrees 74° or in radians $\frac{37 \cdot \pi}{90}$

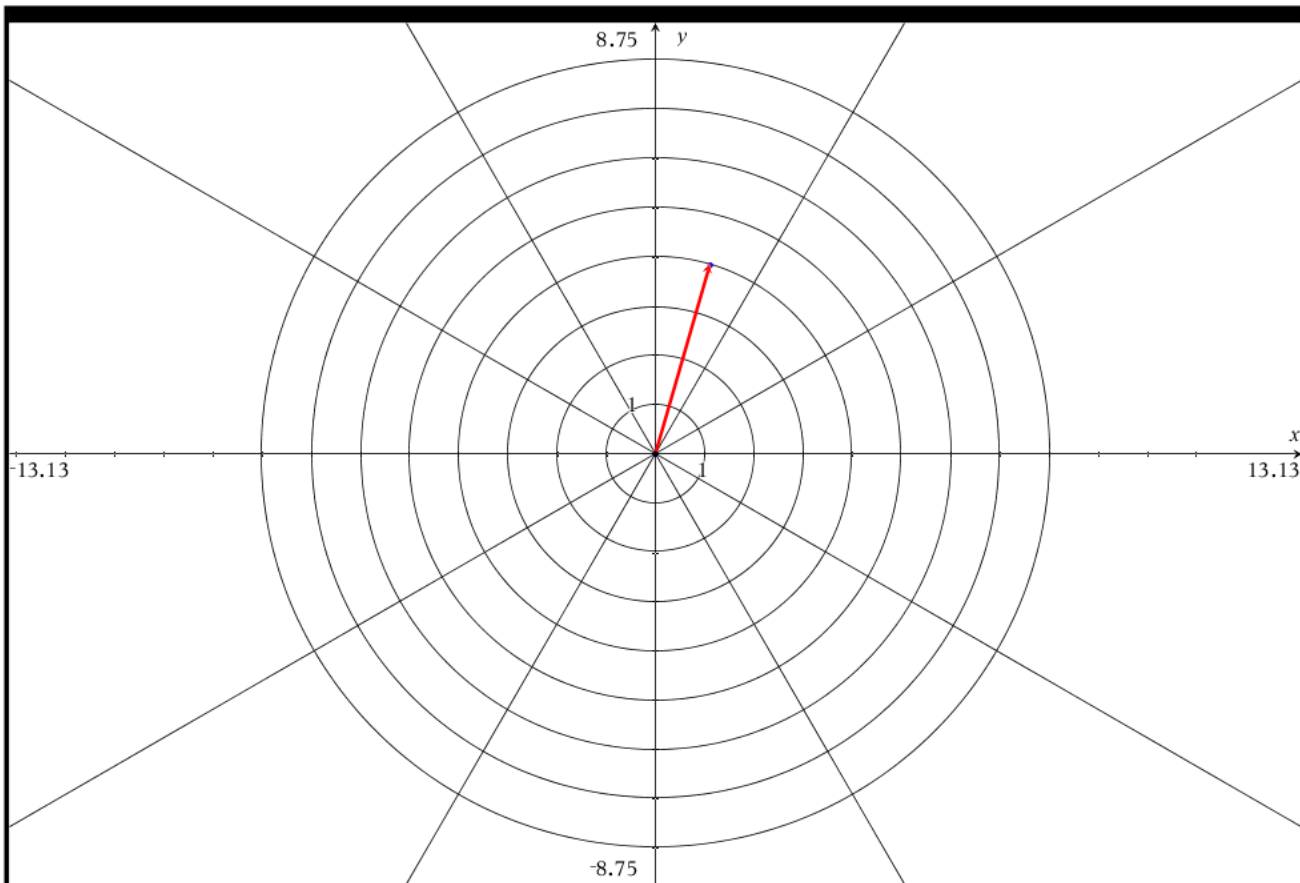
Polar coordinates

$$(4, 74^\circ) \text{ or } (4, \frac{37 \cdot \pi}{90})$$

Rectangular coordinates

$$(4 \cos(74), \text{radius} \sin(74)) \text{ or } (4 \cos(\frac{37 \cdot \pi}{90}), 4 \sin(\frac{37 \cdot \pi}{90}))$$

$$\approx (1.10255, 3.84505)$$



rectangular to polar point

rectangular coordinates $(-5,4)$ $r = \sqrt{(-5)^2 + (4)^2} = \sqrt{25 + 16} = \sqrt{41} = \sqrt{41}$

angle formed by positive x axis can be found with inverse trigonometry

$\tan(\theta) = 4/-5$ so $\theta = \tan^{-1}(4/-5)$

$\theta = -38.6598^\circ$ or $\theta = -0.674741$ radians

OR $\theta = 141.34^\circ$ or $\theta = 2.46685$ radians

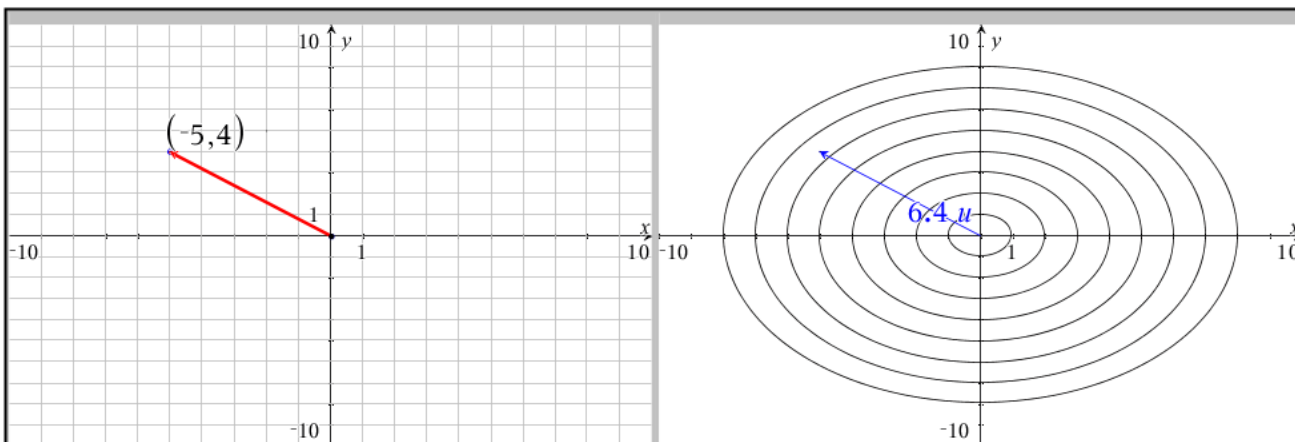
Polar coordinates

$(\sqrt{41}, \tan^{-1}(4/-5))$

$(\sqrt{41}, 141.34^\circ)$ or $(\sqrt{41}, 2.46685 \text{ radians})$

$(6.40312, 141.34^\circ)$ or $(6.40312, 2.46685 \text{ radians})$

	A	B	C	D	E	F	G	H	I	J	K	L	M
=													
1	x		-5										
2	y		4										
3													
4													
5													



Rectangular Coordinates

$(-5,4)$

Polar Coordinates

exact $(\sqrt{41}, 180 + \tan^{-1}(4/-5))$

Degrees

$(\sqrt{41}, 141.34) \approx (6.40312, 141.34)$

radians

$(\sqrt{41}, 2.46685) \approx (6.40312, 2.46685)$

rectangular to polar point

rectangular coordinates $(2, -4)$ $r = \sqrt{[(2)^2 + (-4)^2]} = \sqrt{[4 + 16]} = \sqrt{(20)} = 2 \cdot \sqrt{5}$

angle formed by positive x axis can be found with inverse trigonometry

$\tan(\theta) = -4/2$ so $\theta = \tan^{-1}(-4/2)$

$\theta = -63.4349^\circ$ or $\theta = -1.10715$ radians

OR $\theta = 296.565^\circ$ or $\theta = 5.17604$ radians

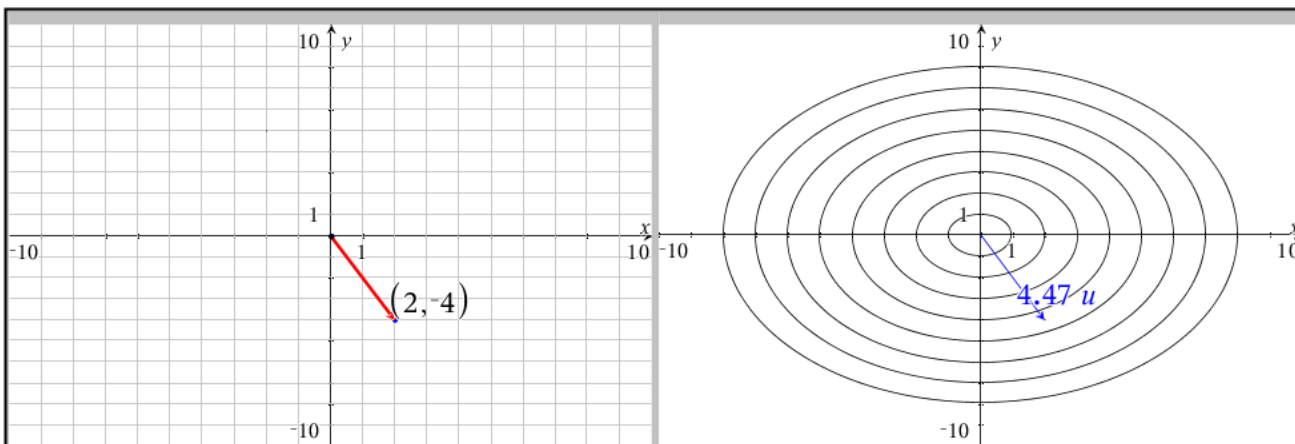
Polar coordinates

$(2 \cdot \sqrt{5}, \tan^{-1}(-4/2))$

$(2 \cdot \sqrt{5}, 296.565^\circ)$ or $(2 \cdot \sqrt{5}, 5.17604 \text{ radians})$

$(4.47214, 296.565^\circ)$ or $(4.47214, 5.17604 \text{ radians})$

	A	B	C	D	E	F	G	H	I	J	K	L	M
=													
1	x		2										
2	y		-4										
3													
4													
5													



Rectangular Coordinates

$(2, -4)$

Polar Coordinates

exact $(2 \cdot \sqrt{5}, 360 + \tan^{-1}(-4/2))$

Degrees

$(2 \cdot \sqrt{5}, 296.565) \approx (4.47214, 296.565)$

radians

$(2 \cdot \sqrt{5}, 5.17604) \approx (4.47214, 5.17604)$

rectangular to polar point

rectangular coordinates $(-4,0)$ $r = \sqrt{(-4)^2 + (0)^2} = \sqrt{16 + 0} = \sqrt{16} = 4$

angle formed by positive x axis can be found with inverse trigonometry

$\tan(\theta) = 0/-4$ so $\theta = \tan^{-1}(0/-4)$

$\theta = 180.^\circ$ or $\theta = 3.14159$ radians

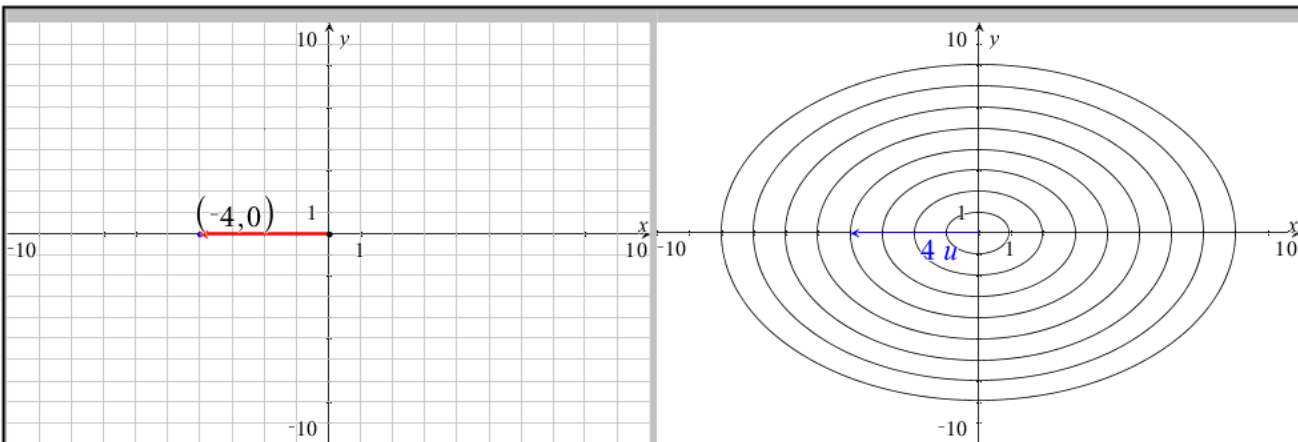
Polar coordinates

$(4, \tan^{-1}(0/-4))$

$(4, 180.^\circ)$ or $(4, \pi \text{ radians})$

$(4., 180.^\circ)$ or $(4., 3.14159 \text{ radians})$

	A	B	C	D	E	F	G	H	I	J	K	L	M
=													
1	x		-4										
2	y		0										
3													
4													
5													



Rectangular Coordinates

$(-4, 0)$

Polar Coordinates

exact $(4, 180 + \tan^{-1}(0/-4))$

Degrees

$(4, 180) \approx (4., 180)$

radians

$(4, \pi) \approx (4., 3.14159)$