

point A

	A	B	C	D	E	F	G	H	I	J	K	L
=												
1	radius		2	point	a							
2	θ		135									
3												
4												
5												
6												

Point a this point has radius =2

the angle that is formed with the positive x axis is in degrees 135° or in radians $\frac{3 \cdot \pi}{4}$

Polar coordinates

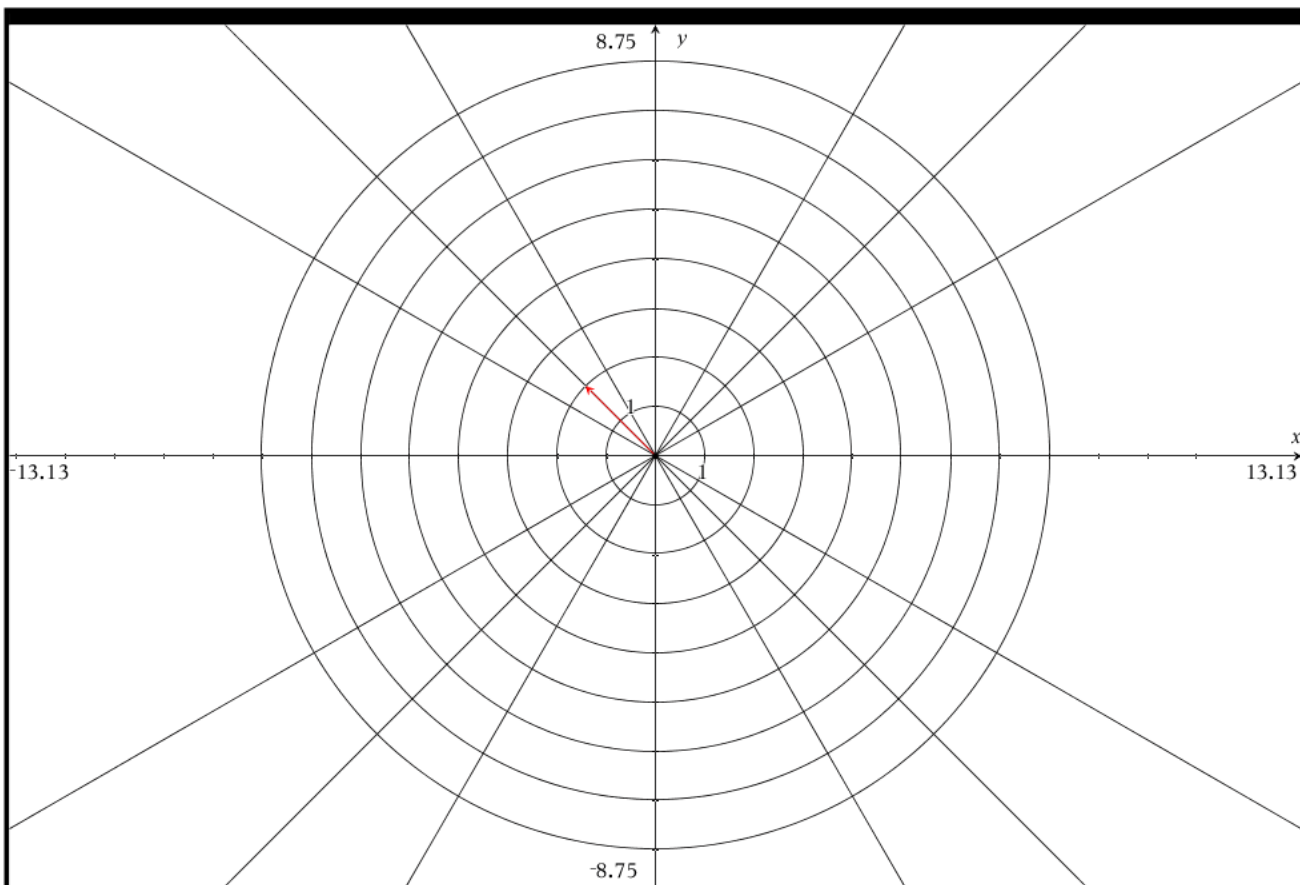
$$(2, 135^\circ) \text{ or } (2, \frac{3 \cdot \pi}{4})$$

Rectangular coordinates

$$(2 \cos(135), 2 \sin(135)) \text{ or } (2 \cos(\frac{3 \cdot \pi}{4}), 2 \sin(\frac{3 \cdot \pi}{4}))$$

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

$$\approx (-1.41421, 1.41421)$$



point B

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		5 point	b									
2	θ		-60										
3													
4													
5													
6													

Point b this point has radius =5

the angle that is formed with the positive x axis is in degrees -60° or in radians $-\frac{\pi}{3}$

Polar coordinates

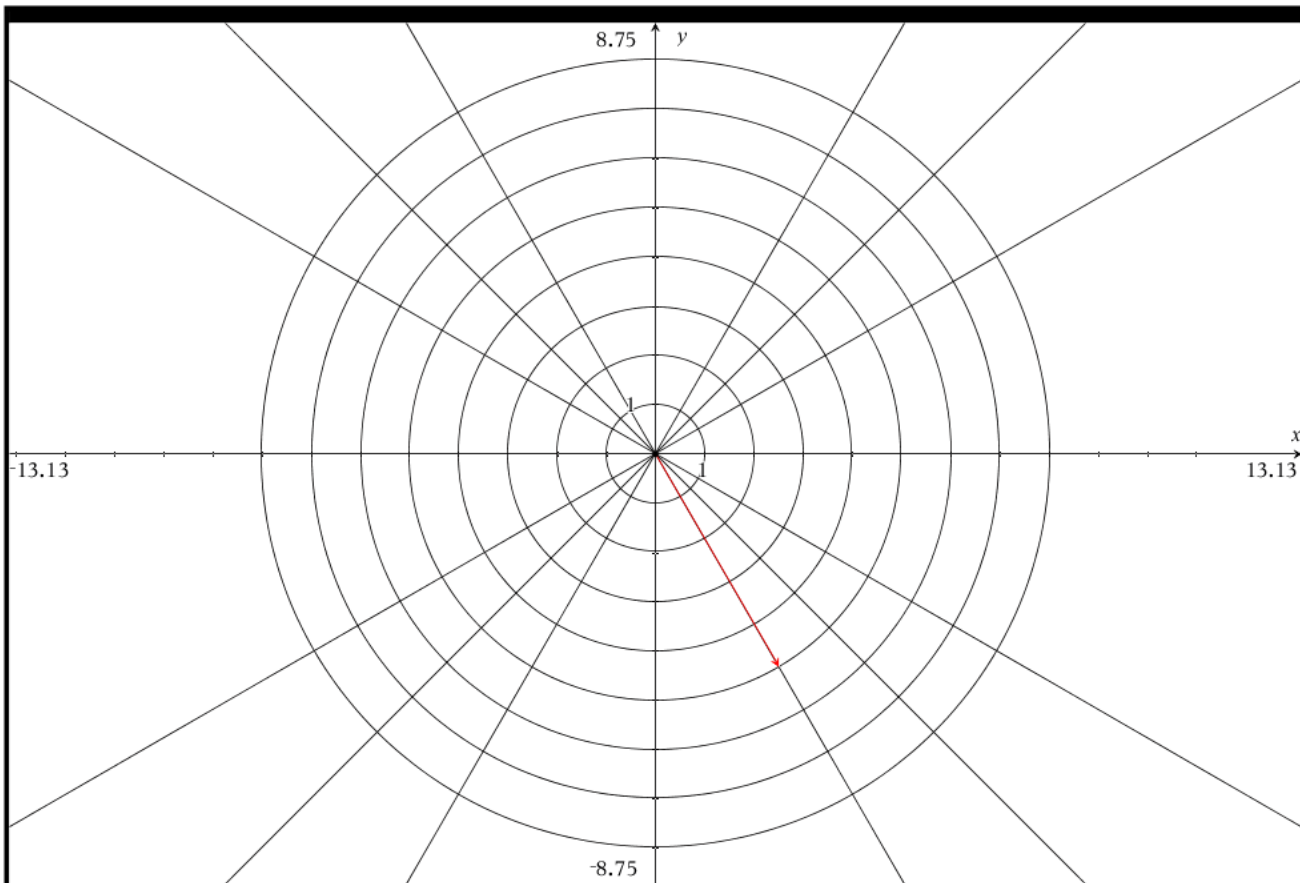
$$(5, -60^\circ) \text{ or } (5, -\frac{\pi}{3})$$

Rectangular coordinates

$$(5 \cos(-60), 5 \sin(-60)) \text{ or } (5 \cos(-\frac{\pi}{3}), 5 \sin(-\frac{\pi}{3}))$$

$$(5 \cdot \frac{1}{2}, 5 \cdot \frac{-\sqrt{3}}{2}) \text{ or } (\frac{5}{2}, \frac{-5\sqrt{3}}{2})$$

$$\approx (2.5, -4.33013)$$



point C

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		7	point	c								
2	θ		120										
3													
4													
5													
6													

Point c this point has radius =7

the angle that is formed with the positive x axis is in degrees 120° or in radians $\frac{2 \cdot \pi}{3}$

Polar coordinates

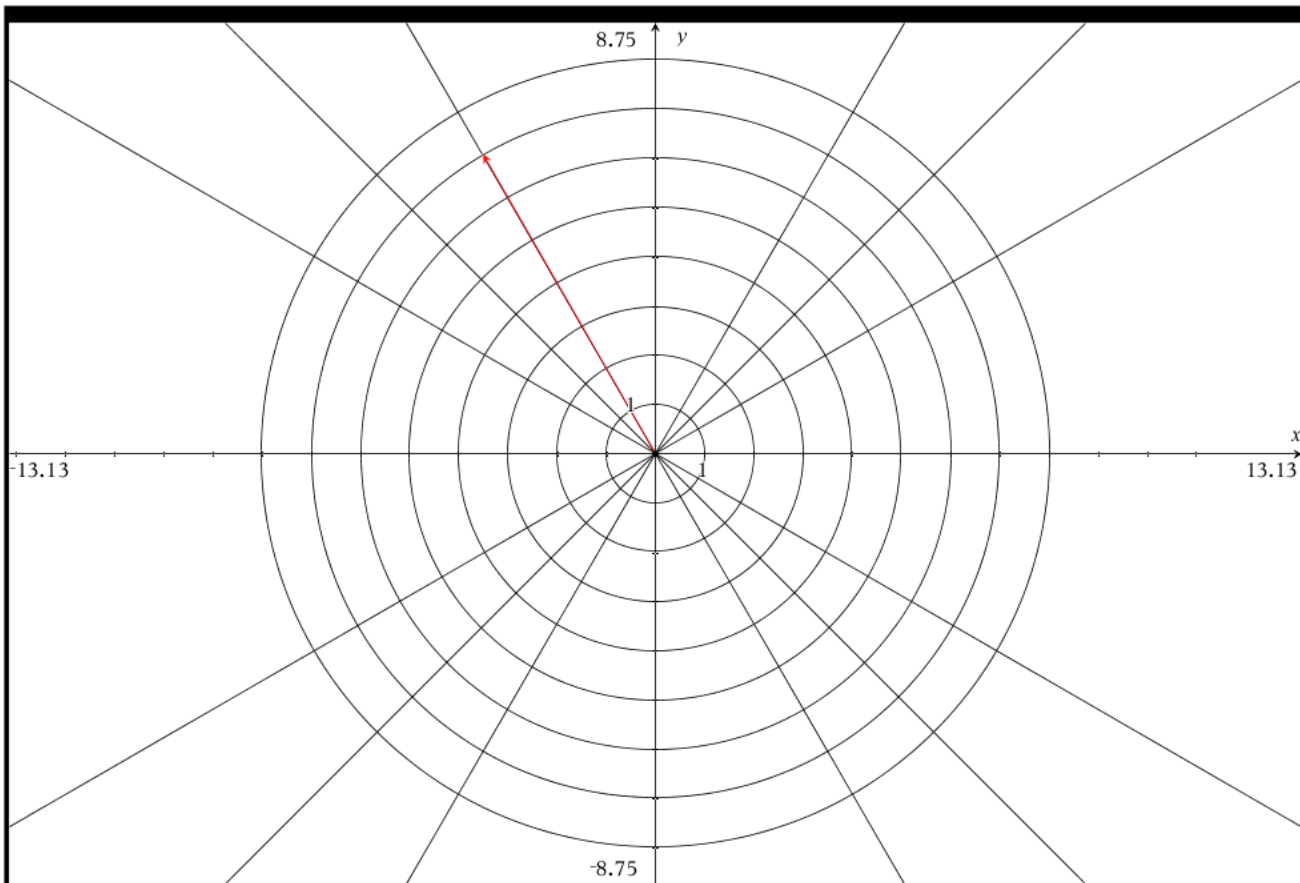
$$(7, 120^\circ) \text{ or } (7, \frac{2 \cdot \pi}{3})$$

Rectangular coordinates

$$(7 \cos(120), 7 \sin(120)) \text{ or } (7 \cos(\frac{2 \cdot \pi}{3}), 7 \sin(\frac{2 \cdot \pi}{3}))$$

$$(7 \cdot \frac{-1}{2}, 7 \cdot \frac{\sqrt{3}}{2}) \text{ or } (\frac{-7}{2}, \frac{7 \cdot \sqrt{3}}{2})$$

$$\approx (-3.5, 6.06218)$$



point D

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		7	point d									
2	θ		120										
3													
4													
5													
6													

Point d this point has radius =7

the angle that is formed with the positive x axis is in degrees 120° or in radians $\frac{2 \cdot \pi}{3}$

Polar coordinates

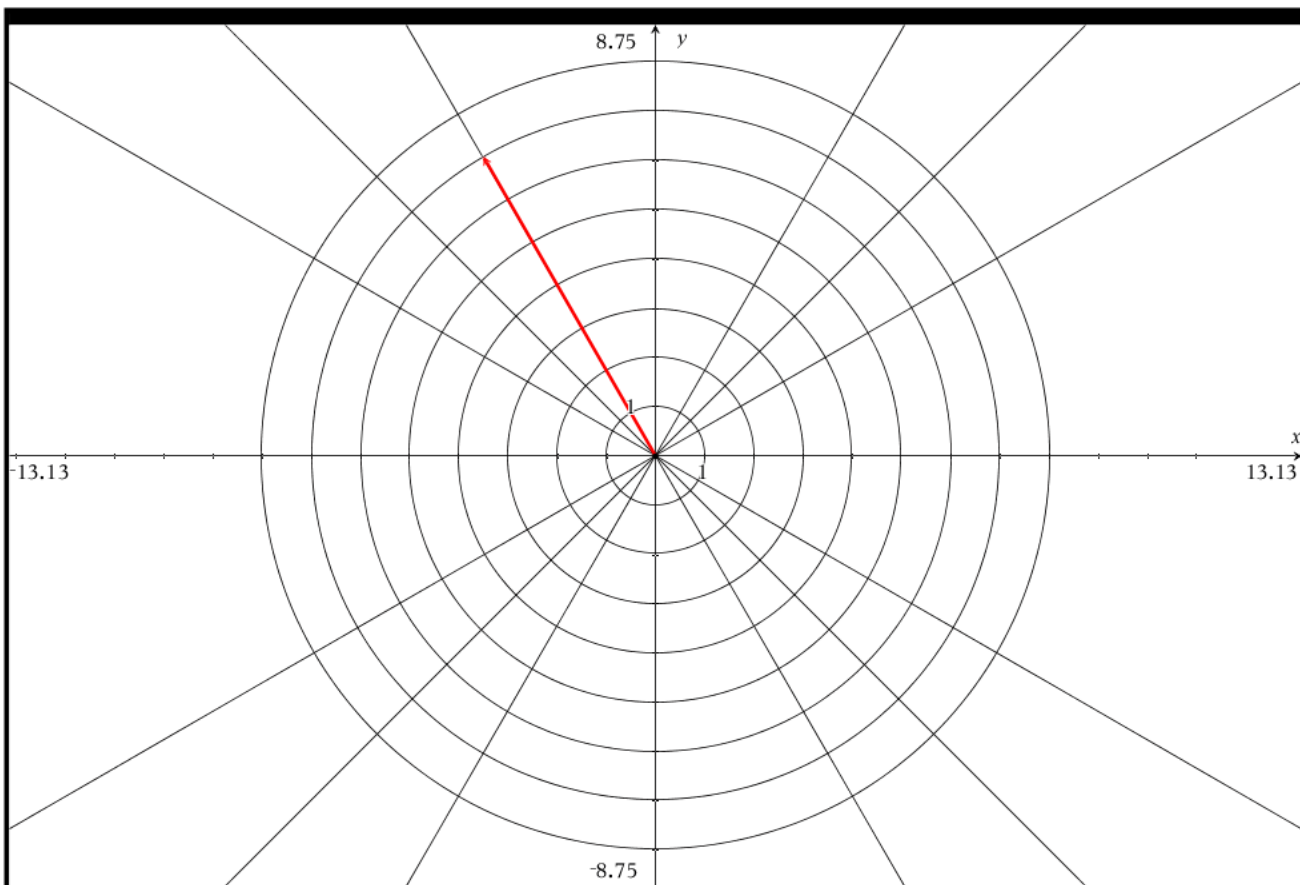
$$(7, 120^\circ) \text{ or } (7, \frac{2 \cdot \pi}{3})$$

Rectangular coordinates

$$(7 \cos(120), 7 \sin(120)) \text{ or } (7 \cos(\frac{2 \cdot \pi}{3}), 7 \sin(\frac{2 \cdot \pi}{3}))$$

$$(7 \cdot \frac{-1}{2}, 7 \cdot \frac{\sqrt{3}}{2}) \text{ or } (\frac{-7}{2}, \frac{7 \cdot \sqrt{3}}{2})$$

$$\approx (-3.5, 6.06218)$$



point E

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		6 point	e									
2	θ		330										
3													
4													
5													
6													

Point e this point has radius =6

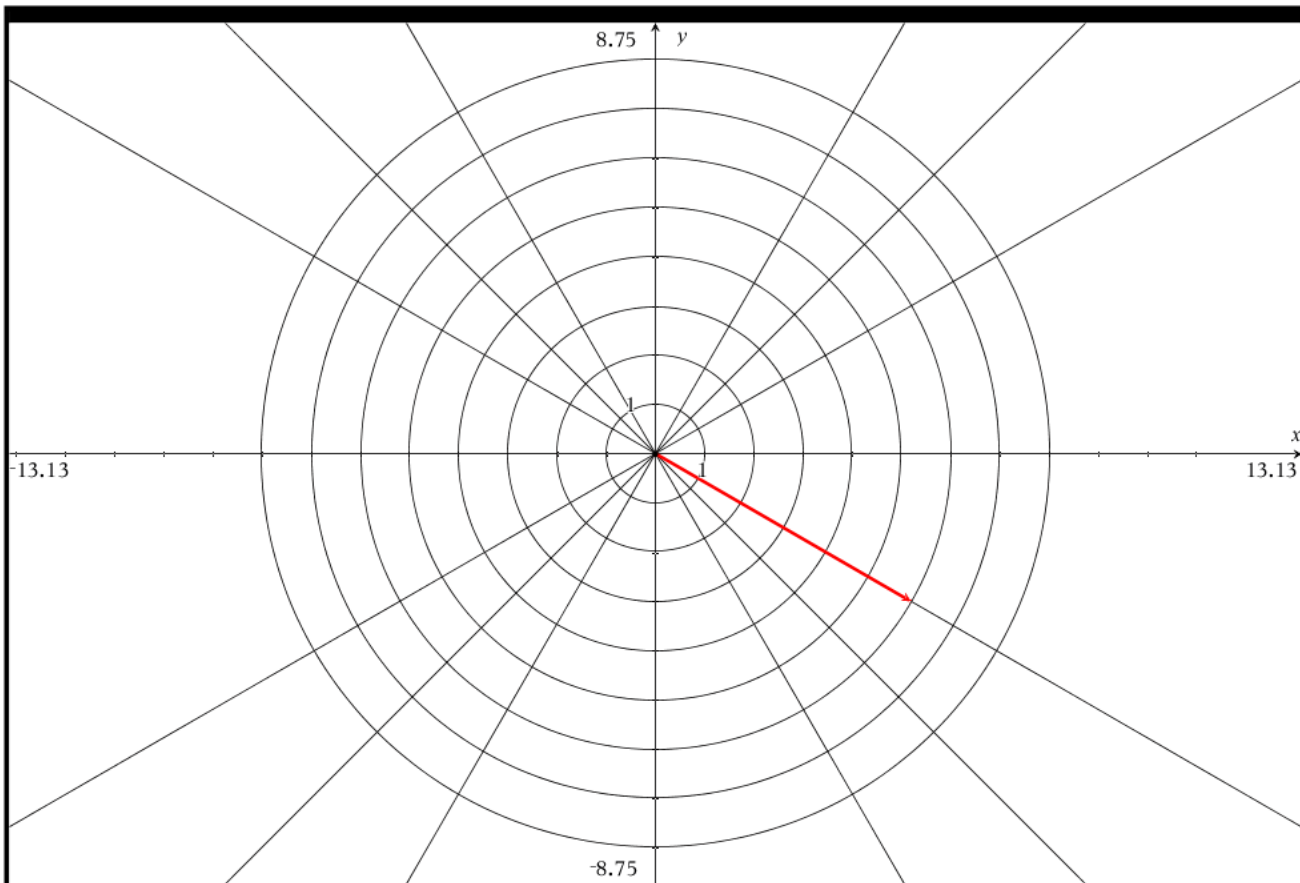
the angle that is formed with the positive x axis is in degrees 330° or in radians $\frac{11 \cdot \pi}{6}$

Polar coordinates

$$(6, 330^\circ) \text{ or } (6, \frac{11 \cdot \pi}{6})$$

Rectangular coordinates

$$(6 \cos(330), 6 \sin(330)) \text{ or } (6 \cos(\frac{11 \cdot \pi}{6}), 6 \sin(\frac{11 \cdot \pi}{6}))$$
$$(6 \cdot \frac{\sqrt{3}}{2}, 6 \cdot \frac{-1}{2}) \text{ or } (3 \cdot \sqrt{3}, -3)$$
$$\approx (5.19615, -3.)$$



point F

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		2	point	f								
2	θ		-45										
3													
4													
5													
6													

Point f this point has radius = 2

the angle that is formed with the positive x axis is in degrees -45° or in radians $-\frac{\pi}{4}$

Polar coordinates

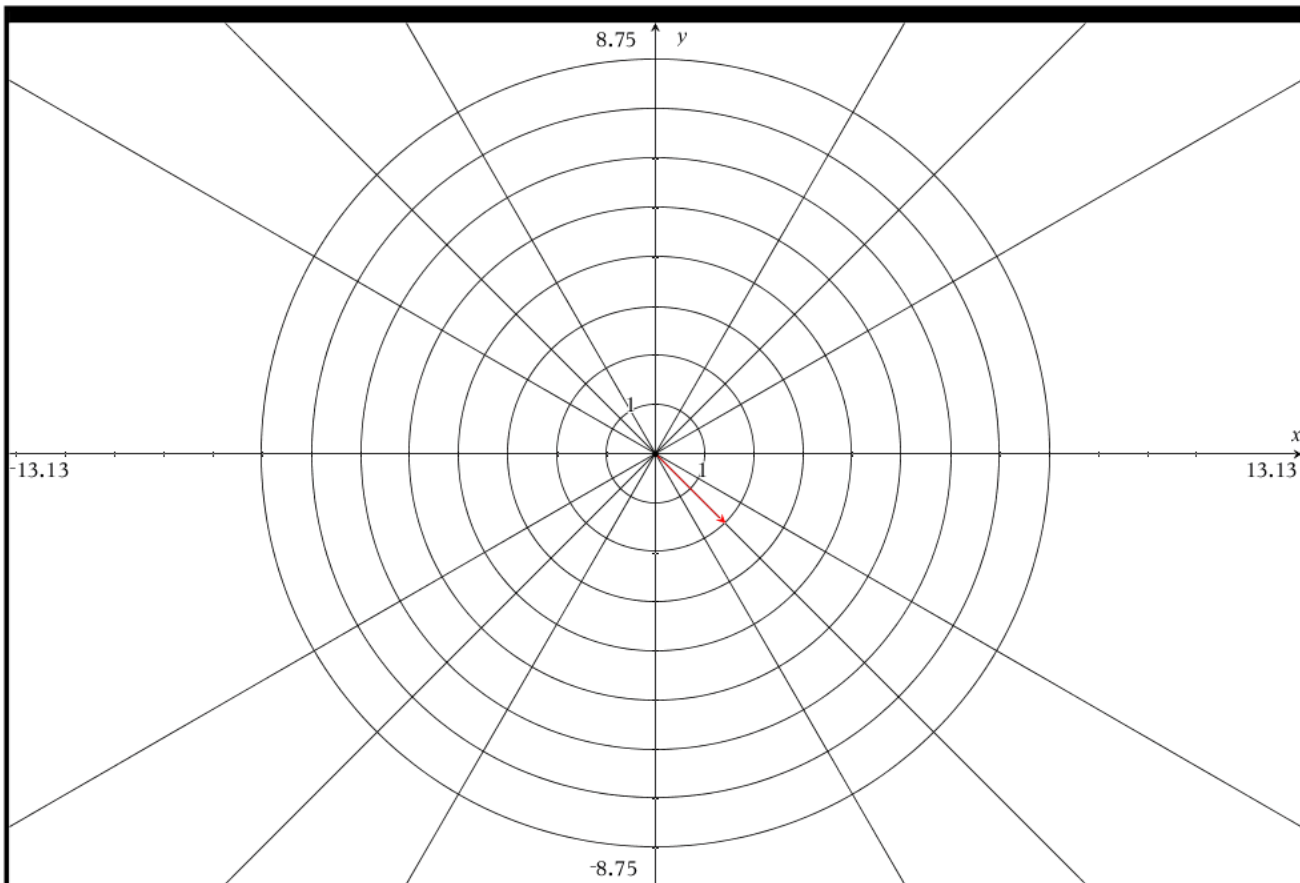
$$(2, -45^\circ) \text{ or } (2, -\frac{\pi}{4})$$

Rectangular coordinates

$$(2 \cos(-45), 2 \sin(-45)) \text{ or } (2 \cos(-\frac{\pi}{4}), 2 \sin(-\frac{\pi}{4}))$$

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

$$\approx (1.41421, -1.41421)$$



point G

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	radius		5	point	g								
2	θ		225										
3													
4													
5													
6													

Point g this point has radius =5

the angle that is formed with the positive x axis is in degrees 225° or in radians $\frac{5 \cdot \pi}{4}$

Polar coordinates

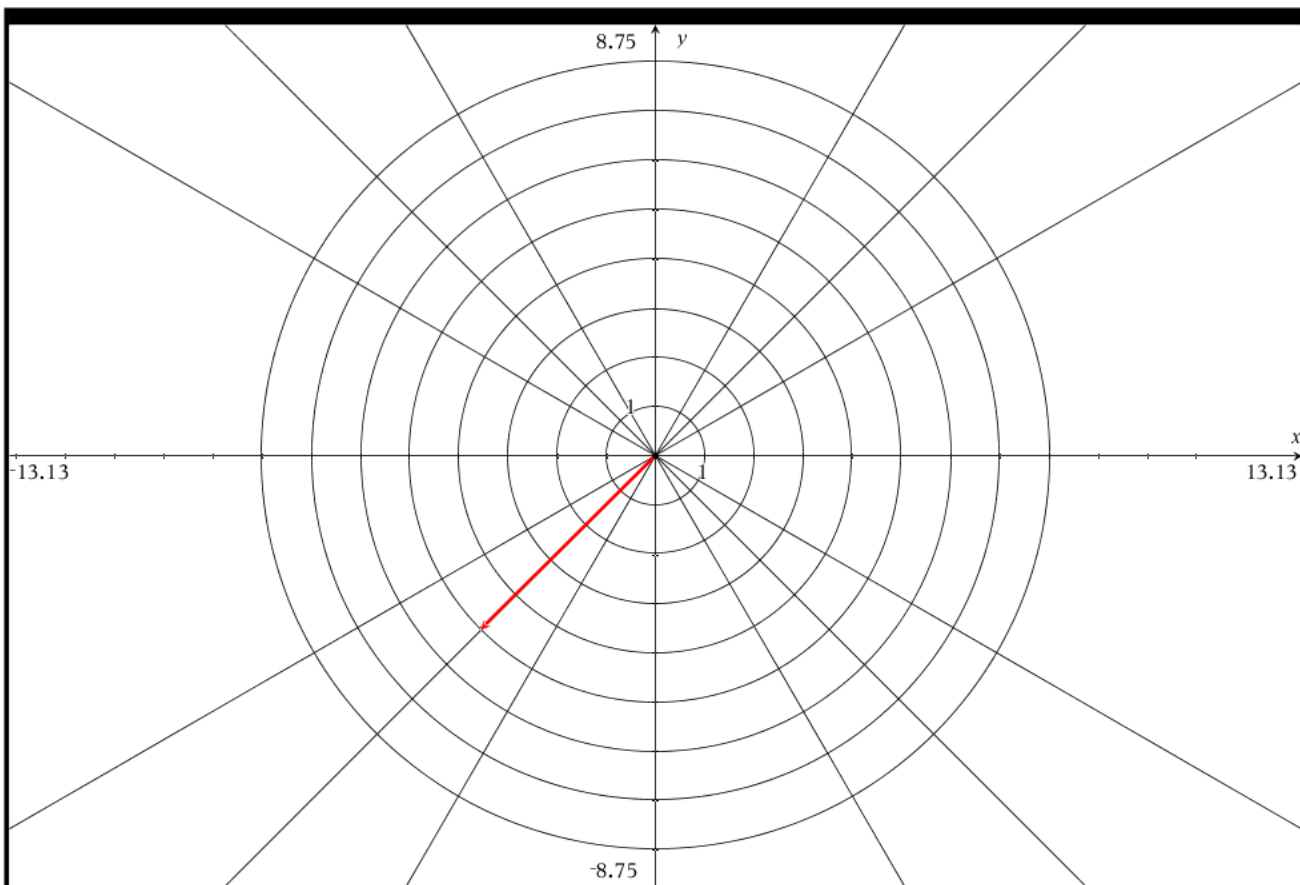
$$(5, 225^\circ) \text{ or } (5, \frac{5 \cdot \pi}{4})$$

Rectangular coordinates

$$(5 \cos(225), 5 \sin(225)) \text{ or } (5 \cos(\frac{5 \cdot \pi}{4}), 5 \sin(\frac{5 \cdot \pi}{4}))$$

$$(5 \cdot \frac{-\sqrt{2}}{2}, 5 \cdot \frac{-\sqrt{2}}{2}) \text{ or } (\frac{-5 \cdot \sqrt{2}}{2}, \frac{-5 \cdot \sqrt{2}}{2})$$

$$\approx (-3.53553, -3.53553)$$



rectangular to polar point A

Point a rectangular coordinates $(-2, 5)$ $r = \sqrt{(-2)^2 + (5)^2} = \sqrt{4 + 25} = \sqrt{29} = \sqrt{29}$

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

$\tan(\theta) = 5/-2$ so $\theta = \tan^{-1}(5/-2)$

$\theta = -68.1986^\circ$ or $\theta = -1.19029$ radians

OR $\theta = 111.801^\circ$ or $\theta = 1.9513$ radians

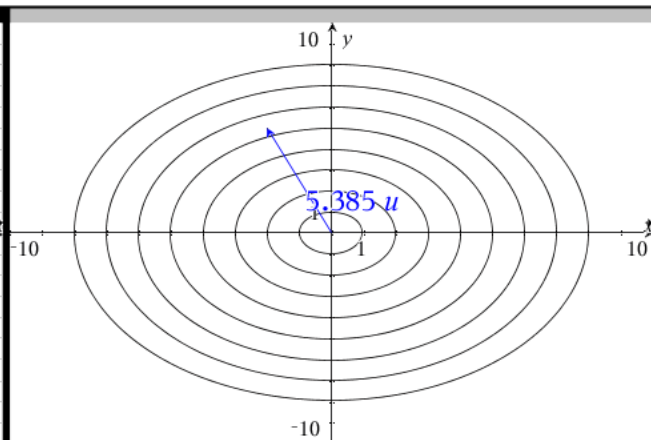
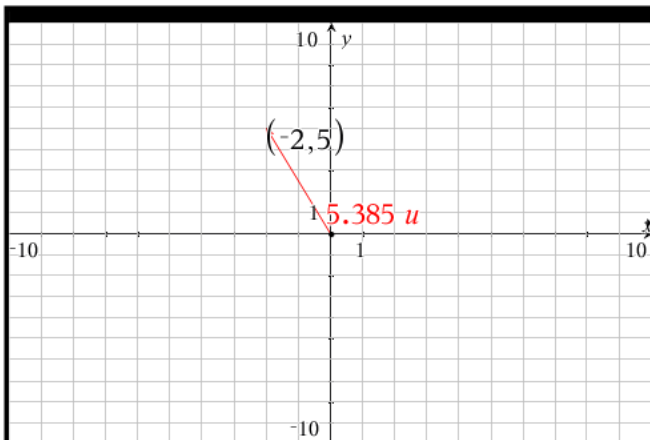
Polar coordinates

$(\sqrt{29}, \tan^{-1}(5/-2))$

$(\sqrt{29}, 111.801^\circ)$ or $(\sqrt{29}, 1.9513 \text{ radians})$

$(5.38516, 111.801^\circ)$ or $(5.38516, 1.9513 \text{ radians})$

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



Rectangular Coordinates

$(-2, 5)$

Polar Coordinates

exact $(\sqrt{29}, 180 + \tan^{-1}(5/-2))$

Degrees

$(\sqrt{29}, 111.801) \approx (5.38516, 111.801)$

radians

$(\sqrt{29}, 1.9513) \approx (5.38516, 1.9513)$

rectangular to polar point B

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

$\theta = 0.^\circ$ or $\theta = 0.$ radians

OR $\theta = 360.^\circ$ or $\theta = 2 \cdot \pi$ radians

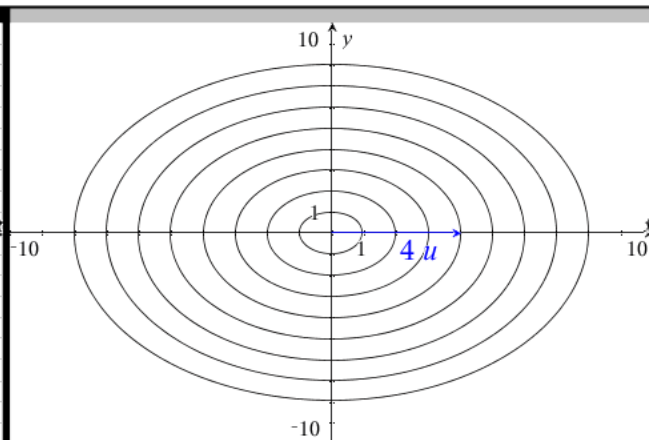
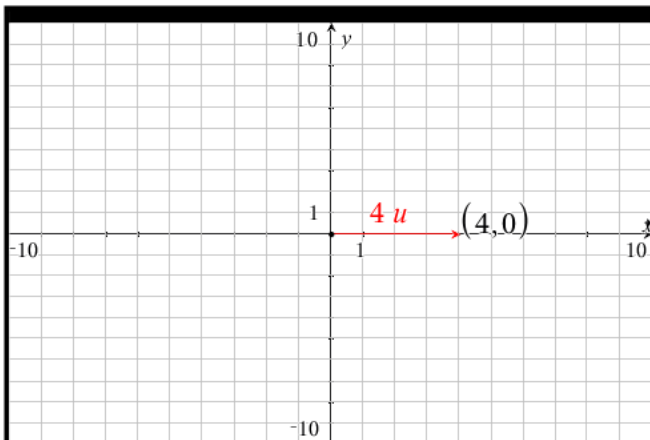
Polar coordinates

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

$(4, 360.^\circ)$ or $(4, 2 \cdot \pi \text{ radians})$

$(4., 360.^\circ)$ or $(4., 2 \cdot \pi \text{ radians})$

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



Rectangular Coordinates

$(4, 0)$

Polar Coordinates

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

Degrees

$(4, 0^\circ) = (4., 360^\circ)$

radians

$(4, 0) \approx (4., 2 \cdot \pi)$

rectangular to polar point C

Point c rectangular coordinates $(-6, -2)$ $r = \sqrt{(-6)^2 + (-2)^2} = \sqrt{36 + 4} = \sqrt{40} = 2 \cdot \sqrt{10}$

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

$\tan(\theta) = -2/-6$ so $\theta = \tan^{-1}(-2/-6)$

$\theta = 18.4349^\circ$ or $\theta = 0.321751$ radians

OR $\theta = 198.435^\circ$ or $\theta = 3.46334$ radians

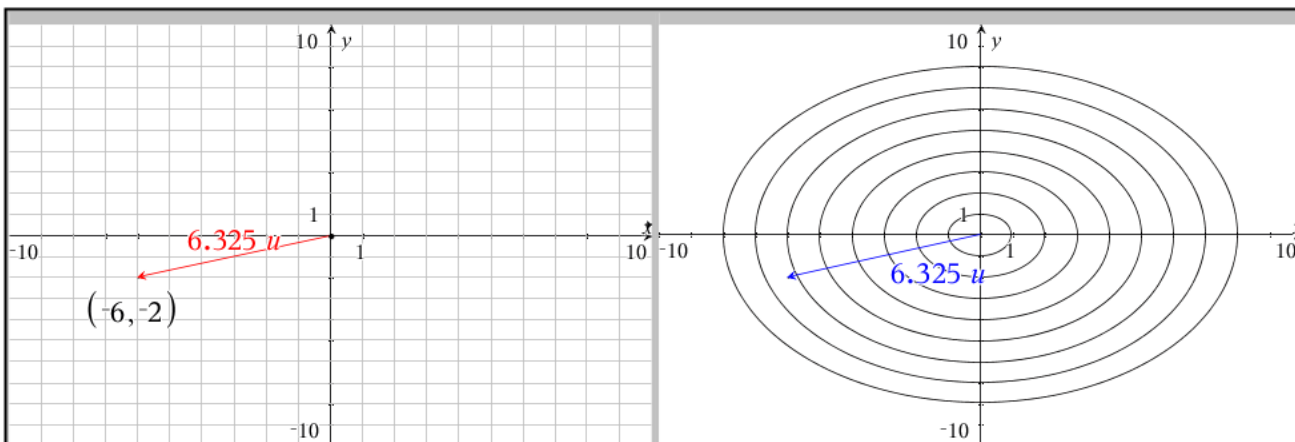
Polar coordinates

$(2 \cdot \sqrt{10}, \tan^{-1}(-2/-6))$

$(2 \cdot \sqrt{10}, 198.435^\circ)$ or $(2 \cdot \sqrt{10}, 3.46334 \text{ radians})$

$(6.32456, 198.435^\circ)$ or $(6.32456, 3.46334 \text{ radians})$

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	x		-6 point	c									
2	y		-2										
3													
4													
5													



Rectangular Coordinates

$(-6, -2)$

Polar Coordinates

exact $(2 \cdot \sqrt{10}, 180 + \tan^{-1}(-2/-6))$

Degrees

$(2 \cdot \sqrt{10}, 198.435^\circ) \approx (6.32456, 198.435^\circ)$

radians

$(2 \cdot \sqrt{10}, 3.46334) \approx (6.32456, 3.46334)$

rectangular to polar point D

Point d rectangular coordinates $(7, -1)$ $r = \sqrt{[(7)^2 + (-1)^2]} = \sqrt{[49 + 1]} = \sqrt{(50)} = 5 \cdot \sqrt{2}$

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

$\tan(\theta) = -1/7$ so $\theta = \tan^{-1}(-1/7)$

$\theta = -8.1301^\circ$ or $\theta = -0.141897$ radians

OR $\theta = 351.87^\circ$ or $\theta = 6.14129$ radians

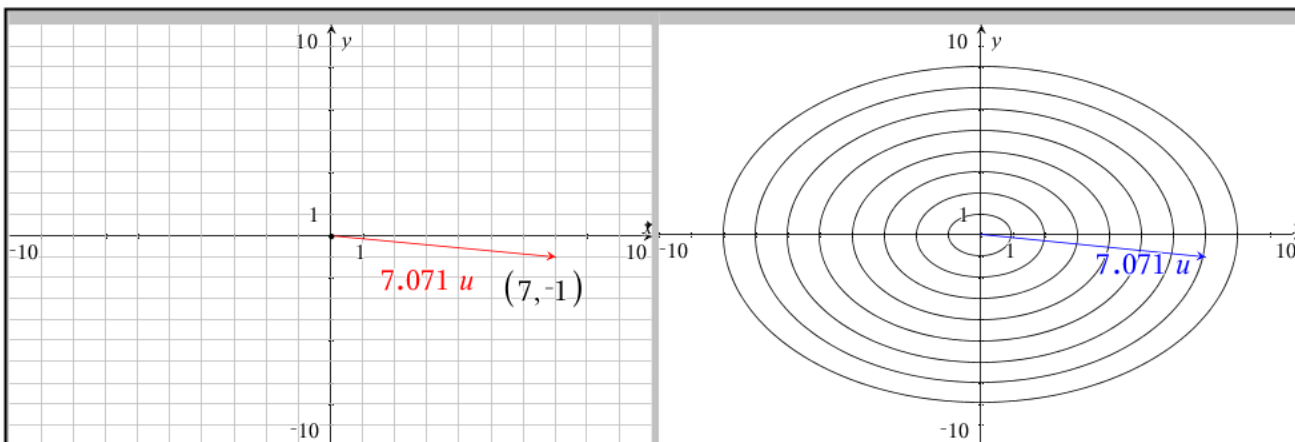
Polar coordinates

$(5 \cdot \sqrt{2}, \tan^{-1}(-1/7))$

$(5 \cdot \sqrt{2}, 351.87^\circ)$ or $(5 \cdot \sqrt{2}, 6.14129 \text{ radians})$

$(7.07107, 351.87^\circ)$ or $(7.07107, 6.14129 \text{ radians})$

	O	P	Q	R	S	T	U	V	W	x_list	x_y_list	Y	Z
=													
3												point	d
4												radius	$5 \cdot \sqrt{2}$
5												polar	351.87
6													
7													



Rectangular Coordinates

$(7, -1)$

Polar Coordinates

exact $(5 \cdot \sqrt{2}, 360 + \tan^{-1}(-1/7))$

Degrees

$(5 \cdot \sqrt{2}, 351.87) \approx (7.07107, 351.87)$

radians

$(5 \cdot \sqrt{2}, 6.14129) \approx (7.07107, 6.14129)$

rectangular to polar point E

Point e rectangular coordinates $(0,8)$ $r = \sqrt{[(0)^2 + (8)^2]} = \sqrt{[0 + 64]} = \sqrt{64} = 8$

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

$$\tan(\theta) = 8/0 \quad \text{so} \quad \theta = \tan^{-1}(8/0)$$

$$\theta = 90^\circ \quad \text{or} \quad \theta = \pm \frac{\pi}{2} \text{ radians}$$

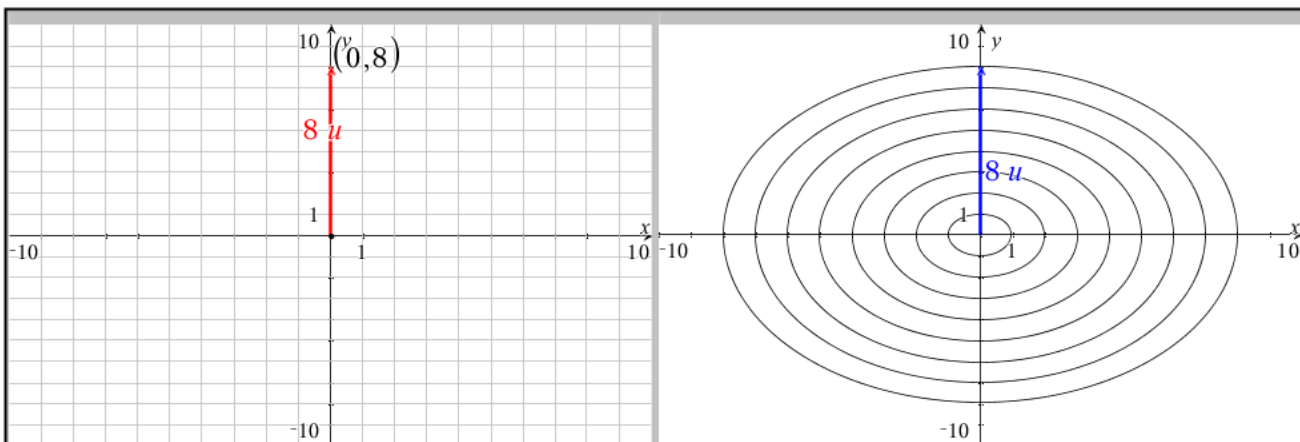
Polar coordinates

$$(8, \tan^{-1}(8/0))$$

$$(8, 90^\circ) \quad \text{or} \quad (8, \pm \frac{\pi}{2} \text{ radians})$$

$$(8, 90^\circ) \quad \text{or} \quad (8, 1.5708 \text{ radians})$$

	A	B	C	D	E	F	G	H	I	J	K	L	M
=													
1 x			0 point	e									
2 y			8										
3													
4													
5													



Rectangular Coordinates

$(0, 8)$

Polar Coordinates

exact $(8, \tan^{-1}(8/0))$

Degrees

$(8, 90^\circ)$

radians

$(8, \frac{\pi}{2}) \approx (8, 1.5708)$

rectangular to polar point F

Point f rectangular coordinates $(-2, 7)$ $r = \sqrt{(-2)^2 + (7)^2} = \sqrt{4 + 49} = \sqrt{53} = \sqrt{53}$

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

$\tan(\theta) = 7/-2$ so $\theta = \tan^{-1}(7/-2)$

$\theta = -74.0546^\circ$ or $\theta = -1.2925$ radians

OR $\theta = 105.945^\circ$ or $\theta = 1.8491$ radians

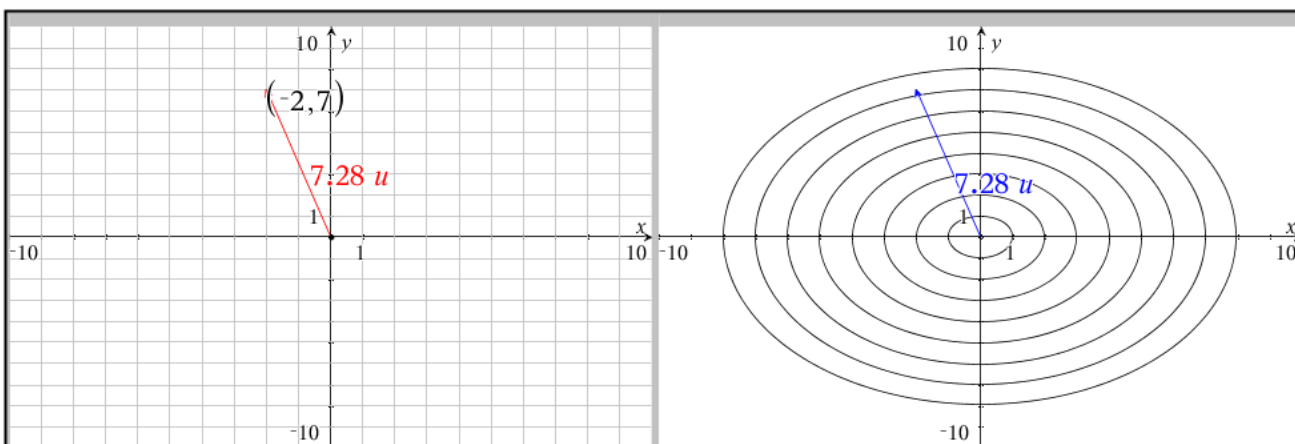
Polar coordinates

$(\sqrt{53}, \tan^{-1}(7/-2))$

$(\sqrt{53}, 105.945^\circ)$ or $(\sqrt{53}, 1.8491 \text{ radians})$

$(7.28011, 105.945^\circ)$ or $(7.28011, 1.8491 \text{ radians})$

	A	B	C	D	E	F	G	H	I	J	K	L
=												
1	x	-2	point	f								
2	y	7										
3												
4												
5												



Rectangular Coordinates

$(-2, 7)$

Polar Coordinates

exact $(\sqrt{53}, 180 + \tan^{-1}(7/-2))$

Degrees

$(\sqrt{53}, 105.945) \approx (7.28011, 105.945)$

radians

$(\sqrt{53}, 1.8491) \approx (7.28011, 1.8491)$

rectangular to polar point G

Point g rectangular coordinates $(0, -6)$ $r = \sqrt{(0)^2 + (-6)^2} = \sqrt{0 + 36} = \sqrt{36} = 6$

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

$\tan(\theta) = -6/0$ so $\theta = \tan^{-1}(-6/0)$

$\theta = 90^\circ$ or $\theta = \frac{\pi}{2}$ radians

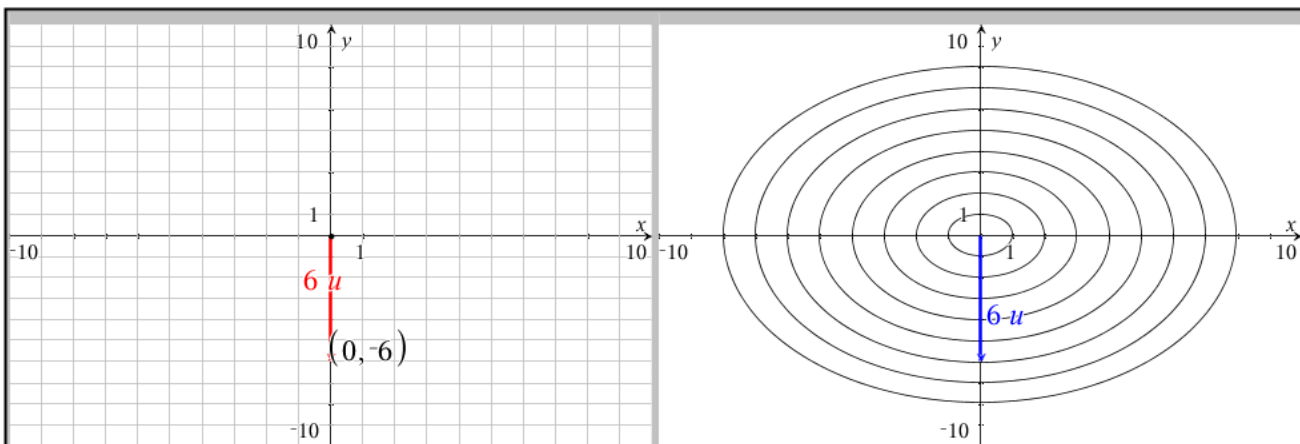
Polar coordinates

$(6, \tan^{-1}(-6/0))$

$(6, -90^\circ)$ or $(6, \frac{\pi}{2}$ radians) or $(6, 270^\circ)$ or $(6, \frac{3 \cdot \pi}{2}$ radians)

$(6., -90^\circ)$ or $(6., -1.5708$ radians) or $(6., 270^\circ)$ or $(6., 4.71239$ radians)

	A	B	C	D	E	F	G	H	I	J	K	L
=												
1	x		0 point	g								
2	y		-6									
3												
4												
5												



Rectangular Coordinates

$(0, -6)$

Polar Coordinates

exact $(6, \tan^{-1}(-6/0))$

Degrees

$(6, -90^\circ) = (6, 270^\circ)$

radians

$(6, \frac{\pi}{2}) \approx (6., -1.5708)$