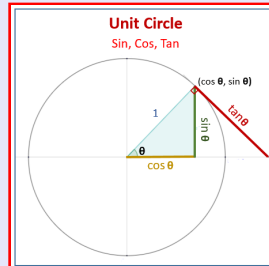


# Trigonometry Final Exam Review

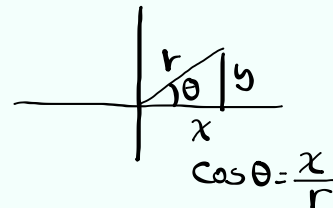


Feb 19-8:47 AM

Convert  $r = 4 \cos \theta$  to rectangular coordinates,  
then graph.

$$r = 4 \cos \theta$$

$$r r = r 4 \cos \theta$$



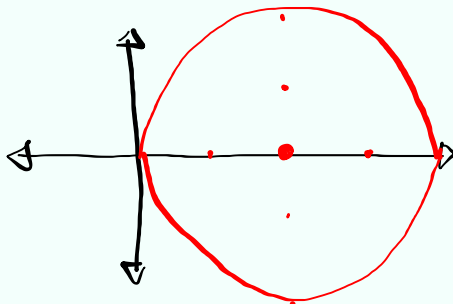
$$r^2 = 4 r \cos \theta \quad x = r \cos \theta$$

$$x^2 + y^2 = 4x$$

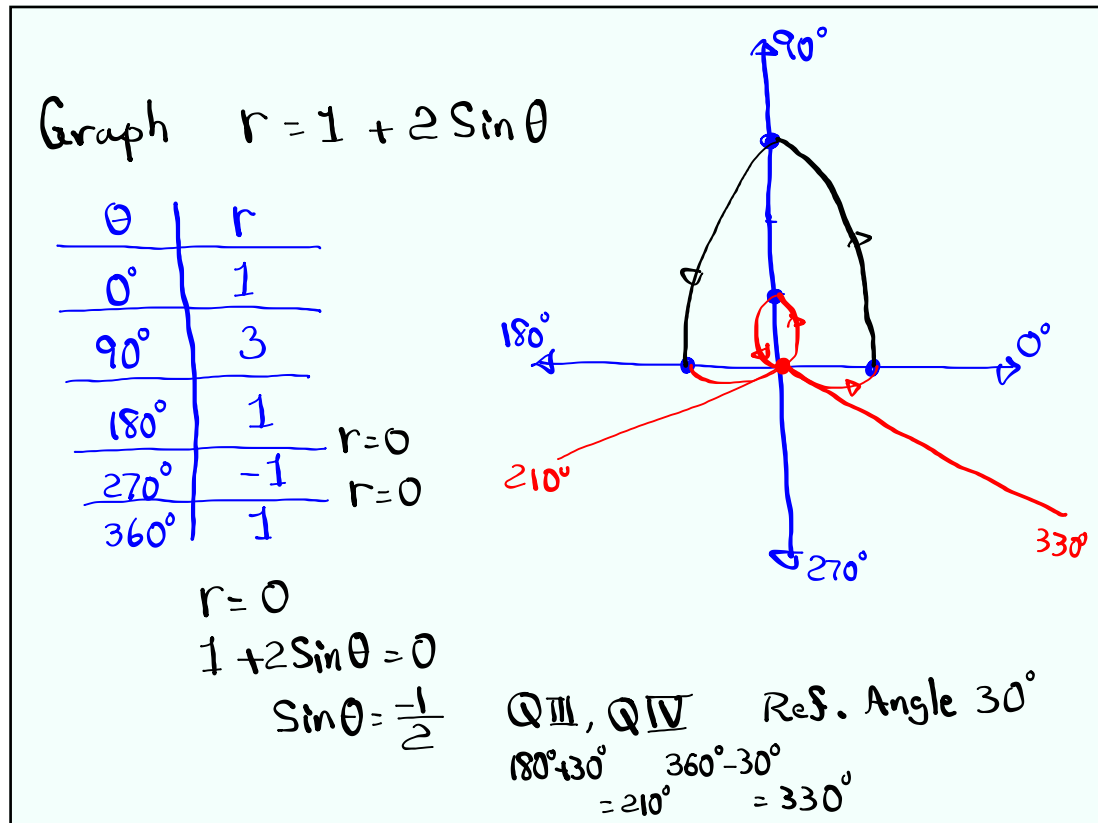
$$x^2 - 4x + 4 + y^2 = 0 + 4$$

$$(x-2)^2 + (y-0)^2 = 2^2$$

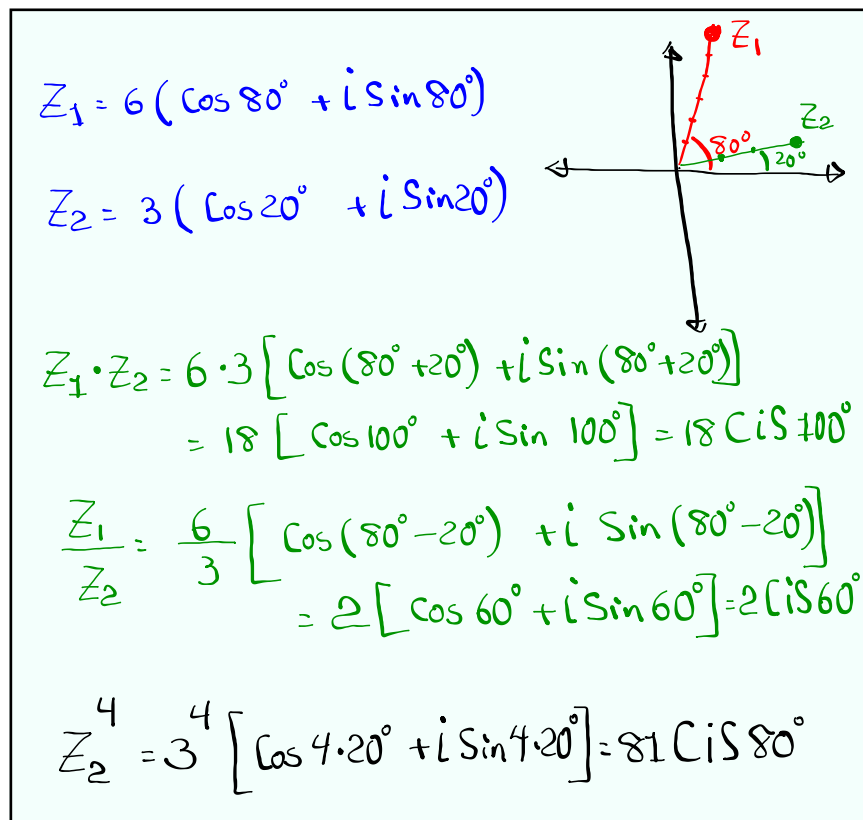
Circle center  $(2, 0)$   
Radius  $2$



Dec 10-10:30 AM



Dec 10-10:34 AM

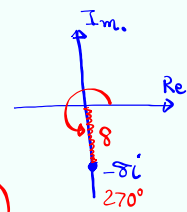


Dec 10-10:40 AM

Find all cube roots of  $-8i$

$n=3$   
3-answers  
 $k=0, 1, 2$

$-8i = 8(\cos 270^\circ + i \sin 270^\circ)$



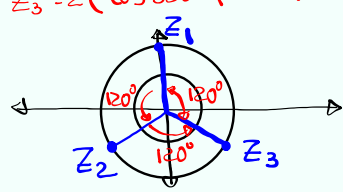
$$\sqrt[3]{8} \left[ \cos \frac{270^\circ + k \cdot 360^\circ}{3} + i \sin \frac{270^\circ + k \cdot 360^\circ}{3} \right]$$

$$= 2 \left[ \cos(90^\circ + k \cdot 120^\circ) + i \sin(90^\circ + k \cdot 120^\circ) \right]$$

$k=0 \quad Z_1 = 2(\cos 90^\circ + i \sin 90^\circ)$

$k=1 \quad Z_2 = 2(\cos 210^\circ + i \sin 210^\circ)$

$k=2 \quad Z_3 = 2(\cos 330^\circ + i \sin 330^\circ)$



Dec 10-10:46 AM

$\tan^2 2\theta - 3 = 0$  Solve  $[0^\circ, 360^\circ)$

$\tan^2 2\theta = 3$

$\tan 2\theta = \pm \sqrt{3}$

$\tan 2\theta = \sqrt{3} \quad \tan 2\theta = -\sqrt{3}$   
Q I, Q III                      Q II, Q IV  
Ref. Angle  $60^\circ$

Q I  $2\theta = 60^\circ + k \cdot 180^\circ \rightarrow \theta = 30^\circ + k \cdot 90^\circ$

Q II  $2\theta = 180^\circ - 60^\circ + k \cdot 180^\circ \rightarrow \theta = 60^\circ + k \cdot 90^\circ$

Q III  $2\theta = 180^\circ + 60^\circ + k \cdot 180^\circ \rightarrow \theta = 120^\circ + k \cdot 90^\circ$

Q IV  $2\theta = 360^\circ - 60^\circ + k \cdot 180^\circ \rightarrow \theta = 150^\circ + k \cdot 90^\circ$

$k=0 \quad 30^\circ, 60^\circ, 120^\circ, 150^\circ$

$k=1 \quad 120^\circ, 150^\circ, 210^\circ, 240^\circ$

$k=2 \quad 210^\circ, 240^\circ, 300^\circ, 330^\circ$

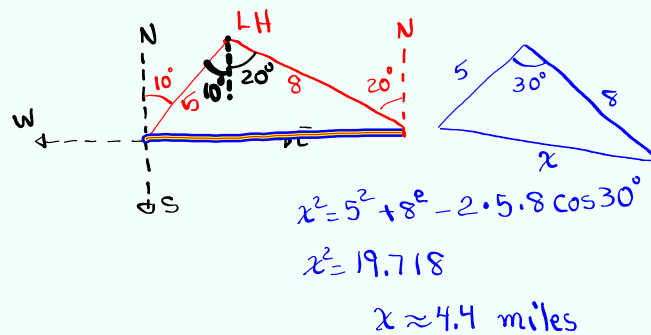
$k=3 \quad 300^\circ, 330^\circ, 390^\circ$

Dec 10-10:54 AM

A ship is 5 miles from a lighthouse with a bearing of  $N 10^\circ E$ .

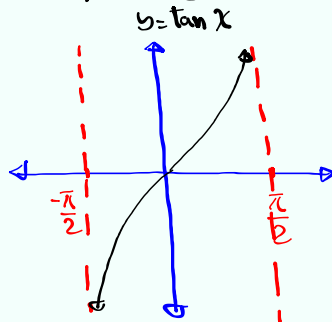
Ship is sailing east, and is 8 miles from that lighthouse with bearing of  $N 20^\circ W$ .

How far the ship sailed east?



Dec 10-11:04 AM

Graph  $y = \tan\left(\frac{\pi x}{4}\right)$



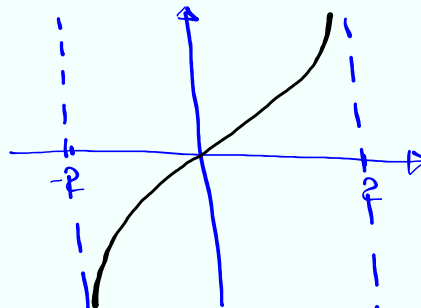
$$-\frac{\pi}{2} < \frac{\pi x}{4} < \frac{\pi}{2}$$

Multiply by 4

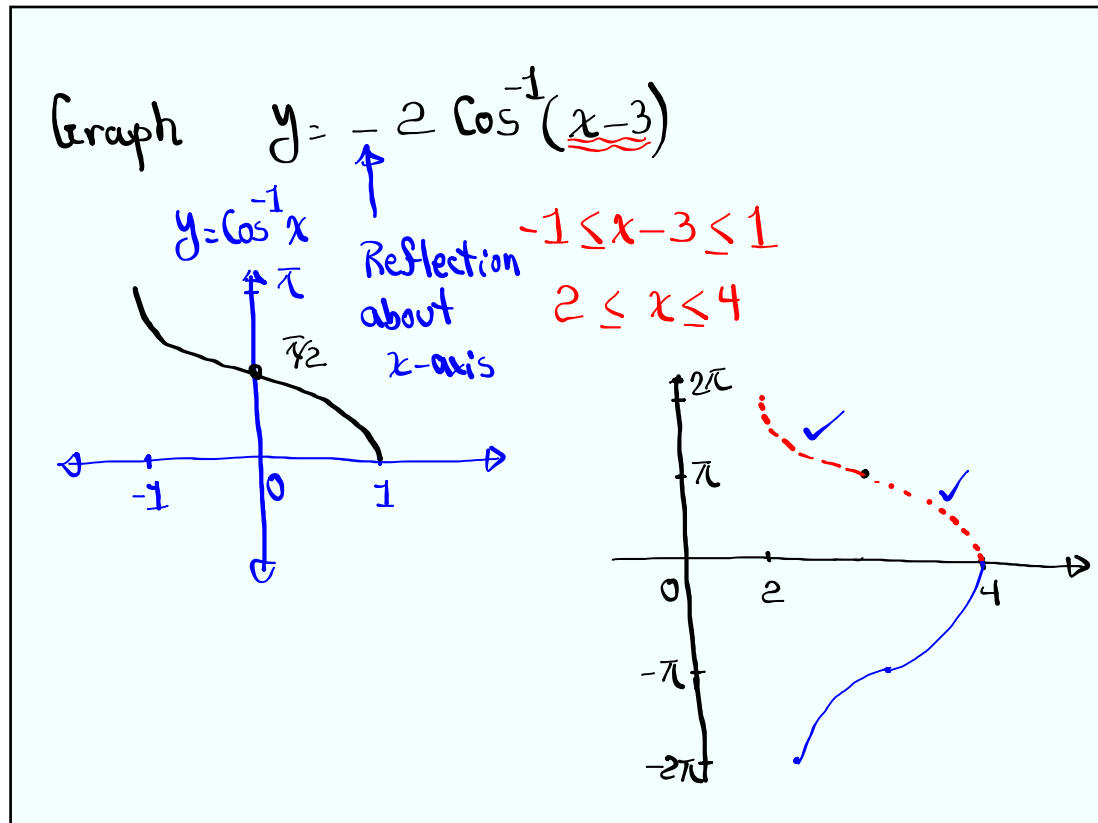
$$-2\pi < \pi x < 2\pi$$

Divide by  $\pi$

$$-2 < x < 2$$

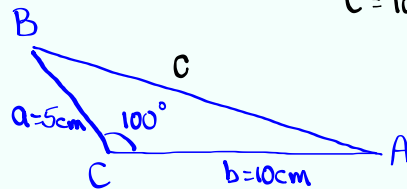


Dec 10-11:11 AM



Dec 10-11:15 AM

Solve triangle ABC if  $a=5\text{cm}$ ,  $b=10\text{cm}$ ,  
 $C=100^\circ$ .



$$c^2 = 5^2 + 10^2 - 2 \cdot 5 \cdot 10 \cdot \cos 100^\circ \quad c \approx 12\text{cm}$$

$$\frac{\sin A}{a} = \frac{\sin C}{c}$$

$$\frac{\sin A}{5} = \frac{\sin 100^\circ}{12}$$

$$\sin A = \frac{5 \sin 100^\circ}{12} \quad \sin A = .41$$

$$\boxed{A \approx 24^\circ}$$

$$B = 180^\circ - (100^\circ + 24^\circ)$$

$$\boxed{B = 56^\circ}$$

Dec 10-11:21 AM

find exact value of  $\cos\left(2 \sin^{-1} \frac{3}{5}\right)$

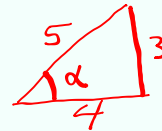
$\cos 2\alpha$

$$= \cos^2 \alpha - \sin^2 \alpha$$

$$= \left(\frac{4}{5}\right)^2 - \left(\frac{3}{5}\right)^2 = \frac{16}{25} - \frac{9}{25} = \boxed{\frac{7}{25}}$$

$$\alpha = \sin^{-1} \frac{3}{5}$$

$$\sin \alpha = \frac{3}{5}$$



Dec 10-11:27 AM