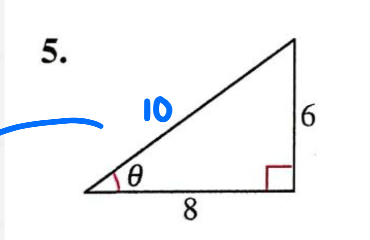
V: z =
x =

Section 4.3

Find the exact values of the six trigonometric functions of the angle θ shown in the figure.



$hyp = \sqrt{8^2 + 6^2}$
$= \sqrt{100}$
$= 10$

$\sin\theta = \frac{6}{10} = \frac{3}{5}$ $\quad \csc\theta = \frac{5}{3}$

$\cos\theta = \frac{8}{10} = \frac{4}{5}$ $\quad \sec\theta = \frac{5}{4}$

$\tan\theta = \frac{6}{8} = \frac{3}{4}$ $\quad \cot\theta = \frac{4}{3}$

Use trigonometric identities to transform the left side of the equation into the right side $(0 < \theta < 2\pi)$.

49. $\tan\alpha\cos\alpha = \sin\alpha$

$\frac{\sin\alpha}{\cancel{\cos\alpha}} \cdot \cancel{\cos\alpha} = \sin\alpha$

$\sin\alpha = \sin\alpha$

$y = \sin x$

$y = \cos x$

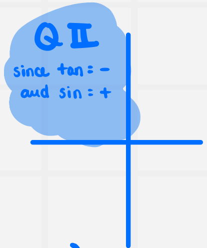
x

$V: z =$
$X =$

Section 4.4

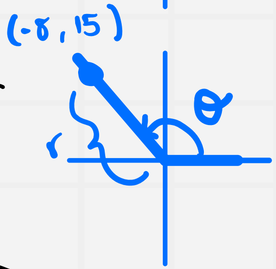
Find the exact values of the six trigonometric functions of θ with the given constraint.

Function Value	Constraint
23. $\tan\theta = -\frac{15}{8}$	$\sin\theta > 0$



$\tan\theta = y/x = -15/8$

$y = 15 \quad , \quad x = -8$



$$r = \sqrt{x^2+y^2} = \sqrt{(-8)^2+(15)^2} = \sqrt{64+225} = \sqrt{289} = 17$$

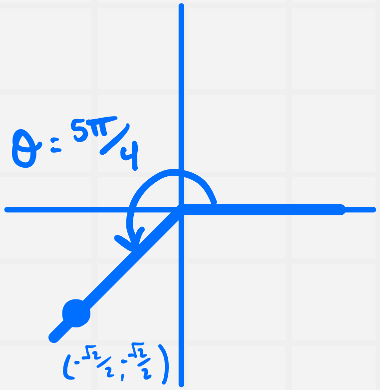
$\sin\theta = 15/17$	$\csc\theta = 17/15$
$\cos\theta = -8/17$	$\sec\theta = -17/8$
$\tan\theta = -15/8$	$\cot\theta = -8/15$

$y = \sin x$

$y = \cos x$

Evaluate the sin, cosine, and tangent of the angle without using a calculator.

61. $\frac{5\pi}{4}$



$\sin 5\pi/4 = -\sqrt{2}/2$

$\cos 5\pi/4 = -\sqrt{2}/2$

$\tan 5\pi/4 = \frac{-\sqrt{2}/2}{-\sqrt{2}/2} = 1$

Section 4.5

$V: \ z =$
$x =$

g is related to a parent function $f(x) = \sin(x)$ or $f(x) = \cos(x)$.

$$g(x) = \cos(x - \pi) + 2$$

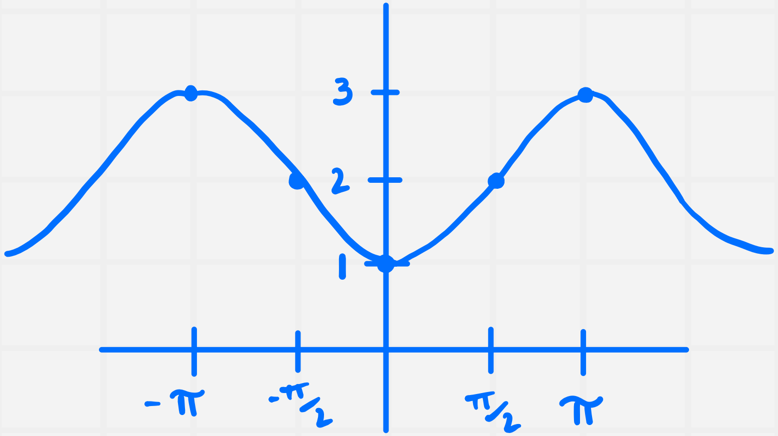
(a) Describe the sequence of transformations from f to g.

$g(x) = \cos(x - \pi) + 2$

shift right π units

shift up 2 units

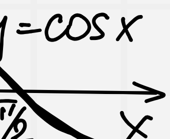
(b) Sketch the graph of g.



(c) Use function notation to write g in terms of f.

$g = f(x - \pi) + 2$

$y = \sin x$



V: z =
X =

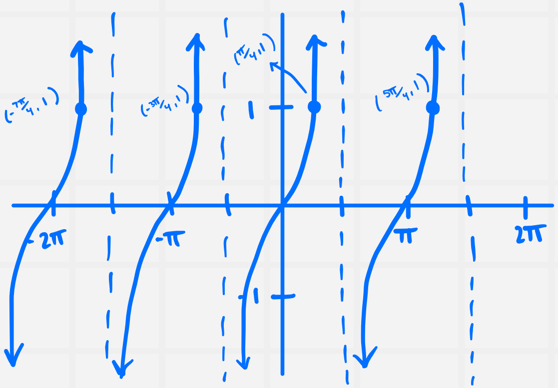
Section 4.6

Can also think at what angle x does $\cot x = -\sqrt{3}/3$?

$\theta = -4\pi/3,\ -\pi/3,\ 2\pi/3,\ 5\pi/3$

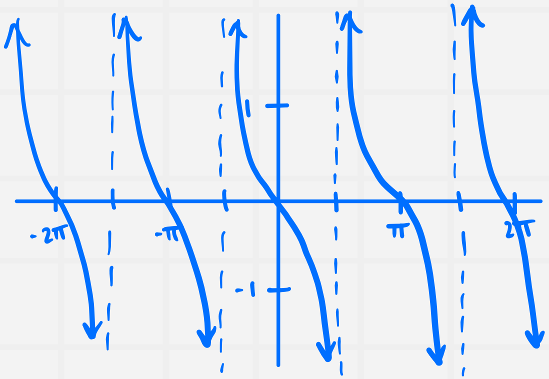
Use a graph to solve the equation on the interval $[-2\pi, 2\pi]$.

49. $\tan x = 1$



$\theta = -7\pi/4,\ -3\pi/4,\ \pi/4,\ 5\pi/4$

51. $\cot x = -\dfrac{\sqrt{3}}{3}$



y = sin x

y = cos x

V: $z=$
$x=$

Section 4.7

Evaluate the expression without using a calculator.

11. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

$\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) = \underline{5\pi/6}$

Use the properties of inverse trigonometric functions to evaluate the expression.

49. $\cos[\arccos(-0.1)]$

$\cos[\arccos(-0.1)] = \underline{-0.1}$

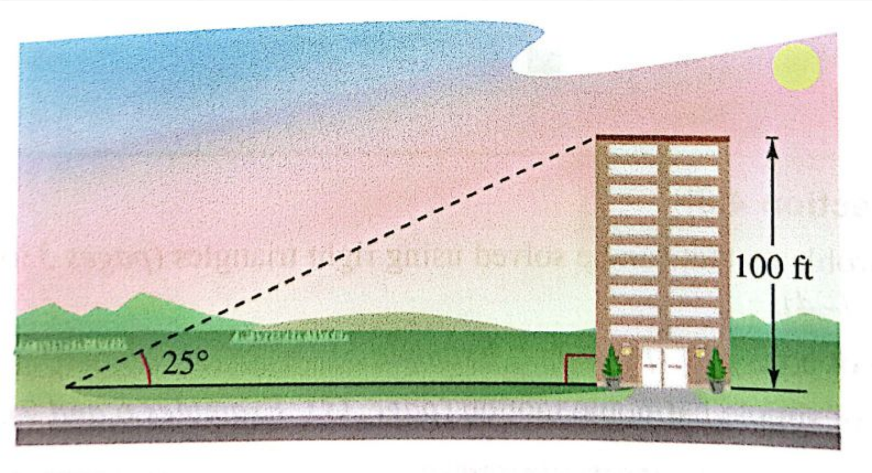
$y=\sin x$

$y=\cos x$

V: z =
X =

Section 4.8

The sun is 25° above the horizon. Find the length of a shadow cast by a building that is 100 feet tall (see figure).



x

$$\tan(25) = \frac{100}{x}$$

$$x = 100/\tan(25) \approx \underline{214.451 \text{ ft}}$$

$y = \sin x$

$y = \cos x$

x

V: z=
X=

Section 5.1

Factor the expression and use the fundamental identities to simplify. There is more than one correct form of each answer.

21. $\tan^2 x - \tan^2 x \sin^2 x$

$$\tan^2 x - \tan^2 x \sin^2 x = \tan^2 x\,(1-\sin^2 x)$$
$$= \tan^2 x\,(\cos^2 x)$$
$$= \frac{\sin^2 x}{\cos^2 x}(\cos^2 x)$$
$$= \underline{\sin^2 x}$$

23. $\dfrac{\sec^2 x - 1}{\sec x - 1}$

$$\frac{\sec^2 x - 1}{\sec x - 1} = \frac{(\sec x + 1)(\sec x - 1)}{\sec x - 1}$$
$$= \underline{\sec x + 1}$$

y=sinx

y=cosx

V: $z =$
$x =$

Section 5.3

Solve the equation.

13. $\cos x + 1 = -\cos x$

$2\cos x + 1 = 0$

$2\cos x = -1$

$\cos x = -\frac{1}{2}$

$x = \arccos(-\frac{1}{2})$

$= \underline{\frac{2\pi}{3} + 2n\pi, \quad \frac{4\pi}{3} + 2n\pi}$

21. $\tan 3x(\tan x - 1) = 0$

$\tan 3x = 0$

$3x = \arctan(0)$

$= 0, \pi$

$= n\pi$

$x = \underline{\frac{n\pi}{3}}$

$\tan x - 1 = 0$

$\tan x = 1$

$x = \arctan(1)$

$= \underline{\frac{\pi}{4} + n\pi}$

$y = \sin x$

$y = \cos x$