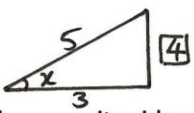
47) If the graph of the function $f(x) = \cos x$ is stretched vertically by a factor of 2 , then the new graph represented the graph of the function is Solution: $2\cos x$	48) If the graph of the function $f(x) = \cos x$ is compressed vertically by a factor of $\frac{1}{2}$, then the new graph represented the graph of the function is Solution: $\frac{1}{2}\cos x$
49) If the graph of the function $f(x) = \cos x$ is compressed horizontally by a factor of 2 , then the new graph represented the graph of the function is Solution: $\cos 2x$	50) If the graph of the function $f(x) = \cos x$ is stretched horizontally by a factor of $\frac{1}{2}$, then the new graph represented the graph of the function is Solution: $\cos\frac{x}{2}$
51) The graph of the function $f(x) = \sqrt{x}$ is reflected about the $x - axis$ if Solution: $f(x) = -\sqrt{x}$	52) The graph of the function $f(x) = \sqrt{x}$ is reflected about the $y - axis$ if Solution: $f(x) = \sqrt{-x}$
53) If the graph of the function $f(x) = e^x$ is shifted a distance 2 units upwards , then the new graph represented the graph of the function is Solution: $e^x + 2$	54) If the graph of the function $f(x) = e^x$ is shifted a distance 2 units downwards , then the new graph represented the graph of the function is Solution: $e^x - 2$
55) If the graph of the function $f(x) = e^x$ is shifted a distance 2 units to the right , then the new graph represented the graph of the function is Solution: e^{x-2}	56) If the graph of the function $f(x) = e^x$ is shifted a distance 2 units to the left , then the new graph represented the graph of the function is Solution: e^{x+2}
57) $\frac{2\pi}{3}$ rad $= \frac{2\pi}{3} \times \frac{180^\circ}{\pi} = 120^\circ$	58) $\frac{5\pi}{6}$ rad $= \frac{5\pi}{6} \times \frac{180^\circ}{\pi} = 150^\circ$
59) $\frac{7\pi}{6}$ rad $= \frac{7\pi}{6} \times \frac{180^\circ}{\pi} = 210^\circ$	60) $\frac{3\pi}{2}$ rad $= \frac{3\pi}{2} \times \frac{180^\circ}{\pi} = 270^\circ$
61) $120^\circ = 120 \times \frac{\pi}{180^\circ} = \frac{2\pi}{3}$ rad	62) $270^\circ = 270 \times \frac{\pi}{180^\circ} = \frac{3\pi}{2}$ rad
63) $\frac{5\pi}{12}$ rad $= \frac{5\pi}{12} \times \frac{180^\circ}{\pi} = 75^\circ$	64) $\frac{5\pi}{6}$ rad $= \frac{5\pi}{6} \times \frac{180^\circ}{\pi} = 150^\circ$ (Repeated)
65) $150^\circ = 150 \times \frac{\pi}{180^\circ} = \frac{5\pi}{6}$ rad	66) $210^\circ = 210 \times \frac{\pi}{180^\circ} = \frac{7\pi}{6}$ rad
67) $\frac{1}{\sec x} = \cos x$	68) $\frac{1}{\csc x} = \sin x$
69) $\frac{1}{\cot x} = \tan x$	70) $\frac{\sin x}{\cos x} = \tan x$
71) $\frac{\cos x}{\sin x} = \cot x$	
72) If $\cos x = \frac{3}{5}$ and $0 < x < \frac{\pi}{2}$, then $\cot x =$ Solution: $\cos x = \frac{3}{5} = \frac{adj}{hyp}$  Now, we should find the length of the opposite side using the Pythagorean Theorem, so $\|\text{opposite}\| = \sqrt{5^2 - 3^2} = \sqrt{25 - 9} = \sqrt{16} = 4$ $\therefore\ \cot x = \frac{1}{\tan x} = \frac{adj}{opp} = \frac{3}{4}$	73) If $\cos x = \frac{3}{5}$ and $0 < x < \frac{\pi}{2}$, then $\tan x =$ Solution: $\cos x = \frac{3}{5} = \frac{adj}{hyp}$ Now, we should find the length of the opposite side using the Pythagorean Theorem, so $\|\text{opposite}\| = \sqrt{5^2 - 3^2} = \sqrt{25 - 9} = \sqrt{16} = 4$ $\therefore\ \tan x = \frac{1}{\cot x} = \frac{opp}{adj} = \frac{4}{3}$

74) If $\cos x = \frac{3}{5}$ and $0 < x < \frac{\pi}{2}$, then $\sin x =$

<u>Solution:</u>

$$\cos x = \frac{3}{5} = \frac{adj}{hyp}$$

Now, we should find the length of the opposite side using the Pythagorean Theorem, so

$|\text{opposite}| = \sqrt{5^2 - 3^2} = \sqrt{25 - 9} = \sqrt{16} = 4$

$$\therefore\ \sin x = \frac{opp}{hyp} = \frac{4}{5}$$

75) If $\cos x = \frac{3}{5}$ and $0 < x < \frac{\pi}{2}$, then $\csc x =$

<u>Solution:</u>

$$\cos x = \frac{3}{5} = \frac{adj}{hyp}$$

Now, we should find the length of the opposite side using the Pythagorean Theorem, so

$|\text{opposite}| = \sqrt{5^2 - 3^2} = \sqrt{25 - 9} = \sqrt{16} = 4$

$$\therefore\ \csc x = \frac{1}{\sin x} = \frac{hyp}{opp} = \frac{5}{4}$$

76) $\sin\left(\frac{5\pi}{6}\right) =$

<u>Solution:</u>

$\frac{5\pi}{6}$ rad $= \frac{5\pi}{6} \times \frac{180^\circ}{\pi} = 150^\circ$

So, we deduce now that $\sin\left(\frac{5\pi}{6}\right)$ is in the second quarter.

$\sin\left(\frac{5\pi}{6}\right) = \sin(150^\circ) = \sin(180^\circ - 30^\circ) = \sin(30^\circ) =$

$\sin\pi6=12$

77) $\cos\left(\frac{5\pi}{6}\right) =$

<u>Solution:</u>

$\frac{5\pi}{6}$ rad $= \frac{5\pi}{6} \times \frac{180^\circ}{\pi} = 150^\circ$

So, we deduce now that $\cos\left(\frac{5\pi}{6}\right)$ is in the second quarter.

$$\cos\left(\frac{5\pi}{6}\right) = \cos(150^\circ) = \cos(180^\circ - 30^\circ)$$

$$= -\cos(30^\circ) = -\cos\left(\frac{\pi}{6}\right) = -\frac{\sqrt{3}}{2}$$

78) $\tan\left(\frac{5\pi}{6}\right) =$

<u>Solution:</u>

$\frac{5\pi}{6}$ rad $= \frac{5\pi}{6} \times \frac{180^\circ}{\pi} = 150^\circ$

So, we deduce now that $\tan\left(\frac{5\pi}{6}\right)$ is in the second quarter.

$$\tan\left(\frac{5\pi}{6}\right) = \tan(150^\circ) = \tan(180^\circ - 30^\circ)$$

$$= -\tan(30^\circ) = -\tan\left(\frac{\pi}{6}\right) = -\frac{1}{\sqrt{3}}$$

79) $\cot\left(\frac{5\pi}{6}\right) =$

<u>Solution:</u>

$\frac{5\pi}{6}$ rad $= \frac{5\pi}{6} \times \frac{180^\circ}{\pi} = 150^\circ$

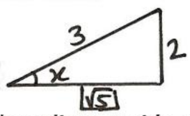
So, we deduce now that $\cot\left(\frac{5\pi}{6}\right)$ is in the second quarter.

$$\cot\left(\frac{5\pi}{6}\right) = \cot(150^\circ) = \cot(180^\circ - 30^\circ)$$

$$= -\cot(30^\circ) = -\cot\left(\frac{\pi}{6}\right) = -\sqrt{3}$$

80) If $\sin x = \frac{2}{3}$ and $0 < x < \frac{\pi}{2}$, then $\sec x =$

<u>Solution:</u>



$$\sin x = \frac{2}{3} = \frac{opp}{hyp}$$

Now, we should find the length of the adjacent side using the Pythagorean Theorem, so

$|\text{adjacent}| = \sqrt{3^2 - 2^2} = \sqrt{9 - 4} = \sqrt{5}$

$$\therefore\ \sec x = \frac{1}{\cos x} = \frac{hyp}{adj} = \frac{3}{\sqrt{5}}$$

81) If $\sin x = \frac{2}{3}$ and $0 < x < \frac{\pi}{2}$, then $\csc x =$

<u>Solution:</u>

$$\sin x = \frac{2}{3} = \frac{opp}{hyp}$$

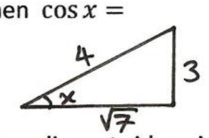
Now, we should find the length of the adjacent side using the Pythagorean Theorem, so

$|\text{adjacent}| = \sqrt{3^2 - 2^2} = \sqrt{9 - 4} = \sqrt{5}$

$$\therefore\ \csc x = \frac{1}{\sin x} = \frac{hyp}{opp} = \frac{3}{2}$$

82) If $\sin x = \frac{3}{4}$ and $0 < x < \frac{\pi}{2}$, then $\cos x =$

<u>Solution:</u>



$$\sin x = \frac{3}{4} = \frac{opp}{hyp}$$

Now, we should find the length of the adjacent side using the Pythagorean Theorem, so

$|\text{adjacent}| = \sqrt{4^2 - 3^2} = \sqrt{16 - 9} = \sqrt{7}$

$$\therefore\ \cos x = \frac{adj}{hyp} = \frac{\sqrt{7}}{4}$$

83) If $\sin x = \frac{3}{4}$ and $0 < x < \frac{\pi}{2}$, then $\cot x =$

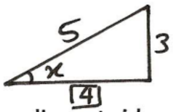
<u>Solution:</u>

$$\sin x = \frac{3}{4} = \frac{opp}{hyp}$$

Now, we should find the length of the adjacent side using the Pythagorean Theorem, so

$|\text{adjacent}| = \sqrt{4^2 - 3^2} = \sqrt{16 - 9} = \sqrt{7}$

$$\therefore\ \cot x = \frac{1}{\tan x} = \frac{adj}{opp} = \frac{\sqrt{7}}{3}$$

84) If $\csc x = -\frac{5}{3}$ and $\frac{3\pi}{2} < x < 2\pi$, then $\cos x =$  Solution: $\csc x = \frac{5}{3} = \frac{1}{\sin x} = \frac{hyp}{opp}$ Now, we should find the length of the adjacent side using the Pythagorean Theorem, so $\lvert\text{adjacent}\rvert = \sqrt{5^2 - 3^2} = \sqrt{25-9} = \sqrt{16} = 4$ $\therefore \cos x = \frac{adj}{hyp} = \frac{4}{5}$	85) If $\csc x = -\frac{5}{3}$ and $\frac{3\pi}{2} < x < 2\pi$, then $\sec x =$ Solution: $\csc x = \frac{5}{3} = \frac{1}{\sin x} = \frac{hyp}{opp}$ Now, we should find the length of the adjacent side using the Pythagorean Theorem, so $\lvert\text{adjacent}\rvert = \sqrt{5^2 - 3^2} = \sqrt{25-9} = \sqrt{16} = 4$ $\therefore \sec x = \frac{1}{\cos x} = \frac{hyp}{adj} = \frac{5}{4}$
86) If $\csc x = -\frac{5}{3}$ and $\frac{3\pi}{2} < x < 2\pi$, then $\cot x =$ Solution: $\csc x = \frac{5}{3} = \frac{1}{\sin x} = \frac{hyp}{opp}$ Now, we should find the length of the adjacent side using the Pythagorean Theorem, so $\lvert\text{adjacent}\rvert = \sqrt{5^2 - 3^2} = \sqrt{25-9} = \sqrt{16} = 4$ $\therefore \cot x = \frac{1}{\tan x} = \frac{adj}{opp} = -\frac{4}{3}$	87) If $\csc x = -\frac{5}{3}$ and $\frac{3\pi}{2} < x < 2\pi$, then $\tan x =$ Solution: $\csc x = \frac{5}{3} = \frac{1}{\sin x} = \frac{hyp}{opp}$ Now, we should find the length of the adjacent side using the Pythagorean Theorem, so $\lvert\text{adjacent}\rvert = \sqrt{5^2 - 3^2} = \sqrt{25-9} = \sqrt{16} = 4$ $\therefore \tan x = \frac{1}{\cot x} = \frac{opp}{adj} = -\frac{3}{4}$
88) If $f(x) = \sin x$, then $D_f = \mathbb{R}$	89) If $f(x) = \cos x$, then $D_f = \mathbb{R}$
88) If $f(x) = \sin x$, then $R_f = [-1,1]$	88) If $f(x) = \sin x$, then $R_f = [-1,1]$