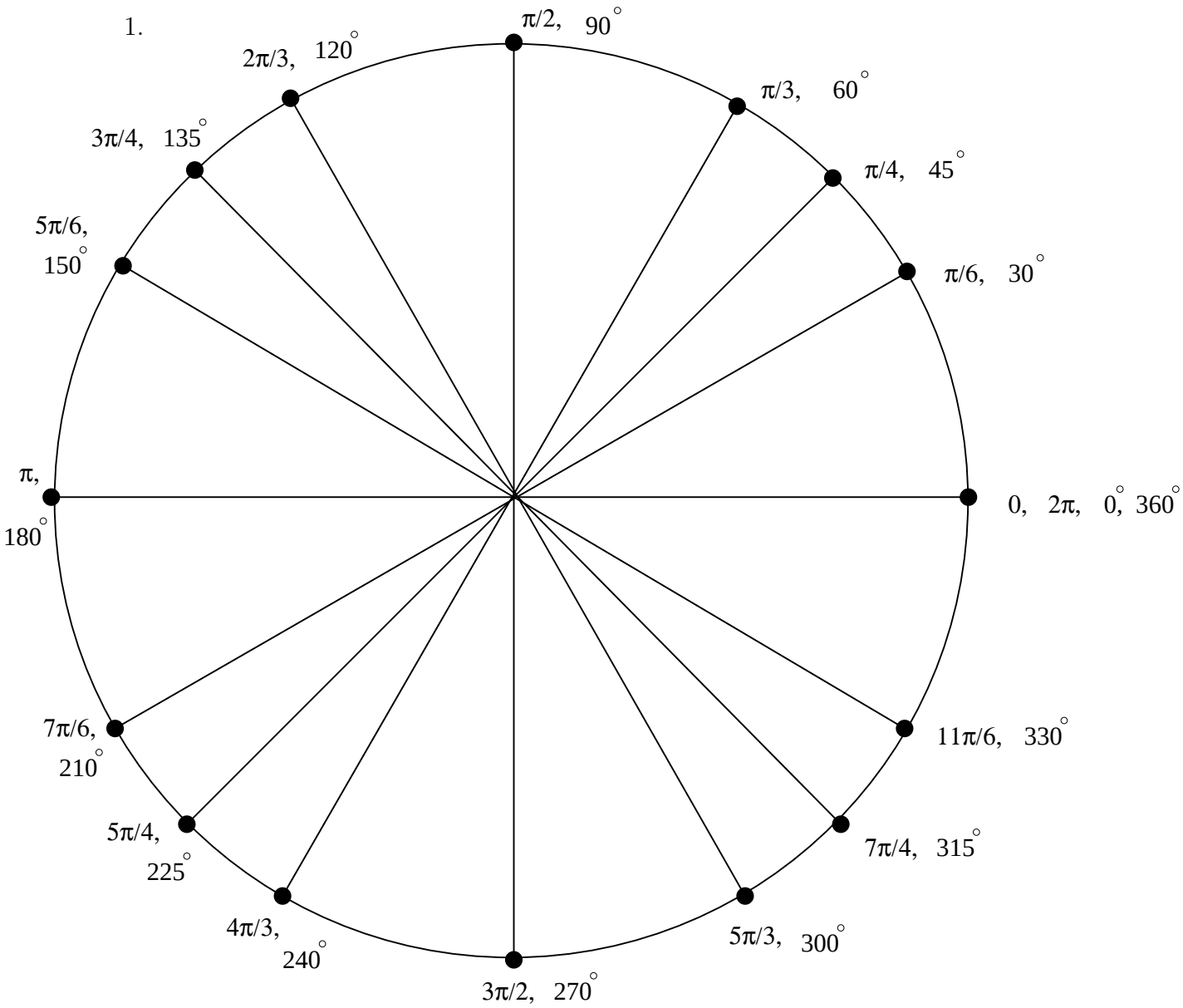
Section 6.1

1.



Section 6.2

1. (a) .7771 (b) 2.6051 (c) .2756
   (d) 1.4281 (e) 2.7904 (f) 6.3925

3. $\sin 55^\circ = 0.8192$, $\cos 55^\circ = 0.5736$, $\tan 55^\circ = 1.4281$,
$\cot 55^\circ = 0.7002$, $\sec 55^\circ = 1.7434$, $\csc 55^\circ = 1.2208$

Section 6.3

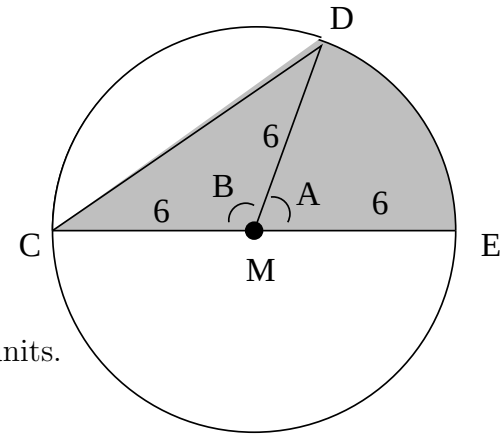
1.

Hour	$0 \le \theta < 2\pi$	$0^\circ \le \theta < 360^\circ$	$\sin(\theta)$	$\cos(\theta)$	$\tan(\theta)$
2:00 a.m.	$\frac{\pi}{6}$	30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
1:30 p.m.	$\frac{\pi}{4}$	45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
9:00 p.m.	π	180°	0	-1	0
10:30 a.m.	$\frac{3\pi}{4}$	135°	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	-1
5:00 p.m.	$\frac{5\pi}{3}$	300°	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\sqrt{3}$
4:30 a.m.	$\frac{7\pi}{4}$	315°	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1

3. $A = 6\left(\frac{1}{2}(1)(1)\sin 60^\circ\right) = \frac{3\sqrt{3}}{2}$

5. $A = 3\left(\frac{1}{2}(1)(1)\sin 60^\circ\right) = \frac{3}{2}\frac{\sqrt{3}}{2} = \frac{3\sqrt{3}}{4}$

7. Since $\angle A = 60°$, we know $\angle B = 120°$.



In, triangle MCD we have

$$\text{area} = \frac{1}{2}\left(6^2\right)\sin 120° = 18\sin 60° = 18 \cdot \frac{\sqrt{3}}{2} = 9\sqrt{3}$$

For sector DME we have

$$\text{area} = \frac{1}{2}\left(6^2\right)\frac{\pi}{3} = 18 \cdot \frac{\pi}{3} = 6\pi$$

So the area of the shaded region is $9\sqrt{3} + 6\pi$ square units.

9. Sum is 0.

The sine of any angle is the $y-$value of the terminal point on the unit circle. We know the sine of any angle in quadrants I and II has a positive value, while the sine of any angle in quadrants III and IV has a negative value. Looking at quadrants I and IV and using referencing angles, we know $\sin 1° + \sin 359° = \sin 1° + (-\sin 1°) = 0$.

Each angle in quadrant IV has a reference angle that corresponds to an angle in quadrant I, and the sine of those pairs sums to zero.

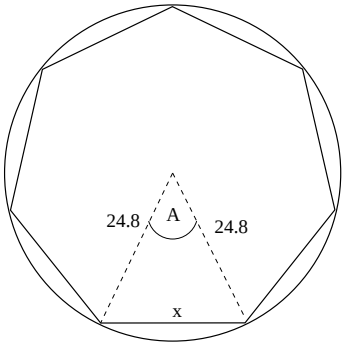
Similarly, each angle in quadrant II has a corresponding angle in quadrant III which has the same reference angle with the opposite sign for the sine value. For example, $\sin 91° + \sin 269° = \sin 89° + (-\sin 89°) = 0$.

So, now we have all angles accounted for except $90°, 180°, 270°$.

Thus,
$\sin 1° + \sin 2° + \ldots + \sin 359° = 0 + \sin 90° + \sin 180° + \sin 270° = 1 + 0 + (-1) = 0$

Section 6.5

1. $A = \dfrac{360°}{7} = 51.43°$



$x^2 = 24.8^2 + 24.8^2 - 2(24.8)(24.8)\cos 51.43°$

$= 2(615.04) - 1230.08(.6234703)$

$= 463.16165$

$x = 21.52119$

So, perimeter $= 7(21.52119) = 150.64833$,
or perimeter is 150.6 inches.