Chapter 5 Objectives

5.1 Angles and Degree Measure

I can change degrees into degrees, minutes and seconds

1a) Change 14.34° into degrees, minutes and seconds.

I can change a specific degree into a decimal

1b) Change $39^\circ 10'$ into a decimal rounded to the nearest thousandth.

I can identify all angles co-terminal with a given angle

1c) Identify all angles co-terminal with 60°.

1d) Determine a coterminal angle that is between 0° and 360° for 870°.

1e) Identify a positive and negative angle co-terminal with -605°.

I can find the reference angle of a given angle.

1f) Find the reference angle for the following angles: $123^\circ, 265^\circ, -278^\circ, 278^\circ$.

I can find the angle measure given a certain number of rotations

1g) 3 rotations counterclockwise

1h) 4.25 rotations clockwise

5.2 Trig Ratios in Right Triangles

Given a coordinate, I can draw a right triangle in the appropriate quadrant and find the 6 trig function of θ

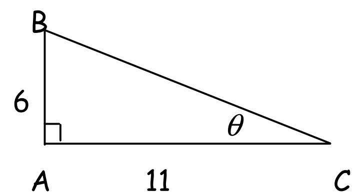
2a) Find the 6 trig functions of an angle in standard position if a point with (-4,-3) lies on its terminal side.

Given a trig ratio, I can find the value of the 5 remaining trig functions.

2b) Suppose θ is an angle in standard position whse terminal side lies in the given quadrant. Find the value of the remaining 5 trig functions if $\sin\theta = \frac{12}{13}$, Quadrant I.

I can find the 6 trig values given a triangle.

2c)



5.3 Trig Functions on the Unit Circle

I can find the values of the 6 trig functions given an angle ($< A = 90^\circ$)	3a) Use the unit circle to find the values of the 6 trig functions for 120°.
I can use the unit circle to find the EXACT value	3b) Use the unit circle to find the exact value of: $\sin(270^\circ)$, $\cos\left(\frac{7\pi}{4}\right)$, $\tan(-135^\circ)$, $\sec\left(\frac{\pi}{3}\right)$
I can use my calculator to find the APPROXIMATE value of an angle.	3c) Find the 6 trig functions of 78.1°. 3d) Approximate your answer to 4 decimal places for the following: $\sec(-19^\circ)$, $\cot\left(\frac{-4\pi}{9}\right)$, $\sin 10$.
I know when to use the proper mode (radians or degrees)	3e) Find $\tan 34.6^\circ, \tan 3.46, \sin 4.73, \cos 1.7^\circ$.

5.4 Applying Trig Functions

Given a right triangle, I can find the missing angle.	4a) If $a = 17.3$ and $B = 77^\circ$, find *c*.
I can interpret a word problem, draw a diagram, and solve the problem.	4b) A squirrel on the ground in looking up at a tree which has myriad acorns on it. The squirrel is a distance of 52 feet from the tree and squirrel is looking up from the ground at an angle of 35°. How tall is the tree?

5.5 Finding Inverse Functions

I can use the inverse of a trig function to solve for the variable	5a) Solve each equation for x: $\tan x = -1$, $\tan x = -\sqrt{3}$, $\sin x = -\frac{\sqrt{3}}{2}$, $\cos^{-1} x = \frac{\sqrt{2}}{2}$
I can evaluate an inverse trig function by drawing a triangle in Quadrant I.	5b) Evaluate the following expressions: $\cos\left(\sin^{-1}\frac{3}{4}\right)$ and $\csc\left(\tan\frac{2}{5}\right)$
Given a right triangle, I can find all the missing parts. ($< A = 90^\circ$)	5c) Given $\triangle ABC$, solve if: $B = 40^\circ, b = 26$ 5d) Given $\triangle ABC$, solve if: $a = 65, c = 55$.

5.6 Law of Sines

I can use Law of Sines to solve a triangle (find all missing parts)	6a) Solve the triangle: $A = 65^\circ, B = 50^\circ, c = 12$ 6b) Solve the triangle: $b = 12, A = 25^\circ, B = 35^\circ$

5.7 Ambiguous Case of Law of Sines

I know that the only time when I have the possibility of an ambiguous case (0,1,or 2 solutions) is when I have a SSA triangle

I can identify when a triangle has no solutions

7a) Solve the triangle: $A = 122°, a = 21, b = 50$

If my given angle is $< 90°$, I can identify when a triangle has 2 possible solutions (if $b \sin A < a < b$)

7b) Solve the triangle: $A = 51°, a = 40, b = 50$

I can find all solutions for a triangle

7c) Solve each triangle: $A = 98°, a = 39, b = 22$; $A = 72.2°, a = 21, b = 22$

5.8 Law of Cosines

I can use Law of Cosines to solve a triangle

8a) Solve each triangle: $A = 39.4°, b = 12, c = 14$; $a = 19, b = 24.3, c = 21.8$

5.6/5.8 Area of Triangles

I know which area formula to use when I am given *2 sides and an angle* ($k = \frac{1}{2} bc \sin A$)

9a) Find the area if $b = 21.2, c = 16.5, A = 25°$

I know which area formula to use when I am given *2 angles and a side* ($k = \frac{1}{2} a^2 \frac{\sin B \sin C}{\sin A}$)

9b) Find the area if $a = 5, B = 37°, C = 84°$

I know which area formula to use when I am given *3 side lengths*

(hero's $k = \sqrt{s(s-a)(s-b)(s-c)}$)

9c) Find the area if $a = 24, b = 52, c = 39$

Solutions:

1a) $14°20'24"$ 1b) 39.167 1c) $60+360k$ 1d) $150°$

1e) possible answers: $115°, 475°, -245°, -965°$ 1f) $57°, 85°, 82°, 82°$ 1g) $1080°$

1h) $-1530°$

2a) $\sin\theta = \frac{-3}{5}, \cos\theta = \frac{-4}{5}, \tan\theta = \frac{3}{4}, \csc\theta = \frac{-5}{3}, \sec\theta = \frac{-5}{4}, \cot\theta = \frac{4}{3}$

2b) $\cos\theta = \frac{5}{13}, \tan\theta = \frac{12}{5}, \csc\theta = \frac{13}{12}, \sec\theta = \frac{13}{5}, \cot\theta = \frac{5}{12}$

2c) $\sin\theta = \frac{6\sqrt{157}}{157}, \cos\theta = \frac{11\sqrt{157}}{157}, \tan\theta = \frac{6}{11}, \csc\theta = \frac{\sqrt{157}}{6}, \sec\theta = \frac{\sqrt{157}}{11}, \cot\theta = \frac{11}{6}$

3a) $\sin\theta = \frac{\sqrt{3}}{2}, \cos\theta = -\frac{1}{2}, \tan\theta = -\sqrt{3}, \csc\theta = \frac{2\sqrt{3}}{3}, \sec\theta = -2, \cot\theta = \frac{-\sqrt{3}}{3}$

3b) $-1, \frac{\sqrt{2}}{2}, 1, 2$

3c)

$\sin 78.1° = .979, \cos 78.1° = 0.206, \tan 78.1° = 4.745, \csc 78.1° = 1.022, \sec 78.1° = 4.850, \cot 78.1° = 0.211$

3d) $1.058, -.176, -.544$ 3e) $0.690, 0.330, -0.999, 0.999$

4a) (answers differ depending on how you draw your triangle→ c=3.89 or c=76.9) 4b) 36.41 feet

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5a) $135°+360k°$ and $315°+360k°$; $120°+180k°$; $240°+360k°$ and $300°+360k°$; $45°+360k°$ and $315°+360k°$ 5b) $\frac{\sqrt{7}}{4}; \frac{\sqrt{29}}{2}$ 5c) $C = 50°, a = 40.4, c = 31.0$

5d) $B = 32.2°, C = 57.8°, b = 34.6$

6a) $C = 65°, a = 12, b = 10.1$ 6b) $C = 120°, a = 8.8, c = 18.1$

7a) no solution

7b) Solution 1: $B \approx 76.3°, c \approx 40.94, C \approx 52.7°$; Solution 2: $B \approx 103.7°, c \approx 22.0, C \approx 25.3°$

7c) Problem #1: $B \approx 34°, C \approx 48°, c \approx 29.3$; Problem #2: $B \approx 85.9°, c \approx 8.2, C \approx 21.9°$ or $B \approx 94.1°, C \approx 13.7°, c \approx 5.2$

8a) $B \approx 58.2°, C \approx 82.4°, a \approx 9.0$; $A \approx 48.3°, B \approx 72.7°, C \approx 59.0°$

9a) $73.2u^2$ 9b) $8.7u^2$ 9c) $442.7u^2$