Test #3 Review
(Covers Ch 5 & Ch 7)

Sec 5.1: Angles and Their Measures

- ✓ Know the definitions that you did for your prepare assignment (can still be found on I-learn).
- ✓ Convert between radians and degrees.
- ✓ KNOW THE UNIT CIRCLE!!!

Problems to try:

From the book: pg 352-353: 43, 55 pg 427: 17, 18

Convert each degree measure to radian measure. Give exact answers.

43. $18°$

Convert each radian measure to degree measure. Round to three decimals.

55. $\frac{5\pi}{12}$

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Fill in the tables. Do not use a calculator.

17.

θ deg	0	30	45	60	90	120	135	150	180
θ rad									
sin θ									
cos θ									
tan θ									

18.

θ deg	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π
θ rad									
sin θ									
cos θ									
tan θ									

Sec 5.2: The Sine and Cosine Functions

- ✓ KNOW THE UNIT CIRCLE!!!!
- ✓ Be able to use the fundamental identity of trig to find angles in given quadrants.
- ✓ Be able to use the motion of a spring formula.

Problems to try:

From the book: pg 427: 19-37 odd

Give the exact values of each of the following expressions. Do not use a calculator.

19. $\sin(-\frac{\pi}{4})$ 21. $\tan\left(\frac{\pi}{3}\right)$ 23. $\csc(-120°)$ 25. $\sin(180°)$

27. $\cos\left(\frac{3\pi}{2}\right)$ 29. $\sec(-\pi)$ 31. $\cot(420°)$ 33. $\cos(-135)$

35. $\sec\left(\frac{2\pi}{3}\right)$ 37. $\tan\left(\frac{5\pi}{6}\right)$

Sec 5.3: The graphs of the Sine and Cosine Functions

- ✓ Be able to graph the sine or cosine function with a period change, phase shift, reflection, amplitude, and vertical change.
- ✓ Be able to find all the transformations and know the domain and range.

Problems to try:

1. From the book: graphs from homework (see I-learn if need to)

Sec 5.4: The Other Trigonometric Functions and Their Graphs

- ✓ Know the relationship between the different trig functions.
- ✓ KNOW THE UNIT CIRCLE!!!!
- ✓ Be able to graph the other trig functions with a phase shift, reflection, amplitude, and vertical change.
- ✓ Be able to find all the transformations and know the domain and range.
- ✓ Refer back to your assignment for graphing 6 different trig functions.

Problems to try:

2. From the book: graphs from homework (see I-learn if need to)

Graph with all parts:

1. $y = -3\sin\left(x + \frac{\pi}{3}\right) + 1$
2. $y = \frac{1}{2}\cos(2x - \pi) - 3$
3. $y = \cot(3x) + 1$
4. $y = -3\tan\left(\frac{1}{4}x - \pi\right) + 2$
5. $y = -4\sin\left(3x - \frac{\pi}{2}\right) - 1$
6. $y = -2\cos\left(x + \frac{\pi}{4}\right) + 3$
7. $y = -\tan\left(x - \frac{\pi}{4}\right) + 3$
8. $y = -\frac{1}{3}\csc\left(2x - \frac{\pi}{3}\right) + 5$

Sec 5.5: The Inverse Trigonometric Functions

- ✓ Be able to explain when to use the trig function and when to use an inverse trig function.
- ✓ Be able to find inverse trig functions and composition functions without a calculator.
- ✓ Be able to find inverse trig functions and composition functions with a calculator.

Problems to try:

3. From the book: pg 408: 35-80 m5

Find the exact value of each expression without using a calculator or table.

35. $\sec^{-1}(2)$ 40. $\operatorname{arccot} -\sqrt{3}$ 45. $\cot^{-1}(-1)$

Find the approximate value of each expression with a calculator. Round answers to two decimal places.

50. $\sin^{-1}(-0.4138)$ 55. $\sec^{1}(-3.44)$ 60. $\operatorname{arccot}\left(-\sqrt{5}\right)$

Find the exact value of each composition without using a calculation or table.

65. $\tan(\arccos\left(\frac{1}{2}\right))$ 70. $\sec^{-1}(\sec\left(\frac{\pi}{3}\right))$ 75. $\cos^{-1}(\cos\left(\frac{3\pi}{2}\right))$

80. $\cos^{-1}(0.5\tan\left(\frac{\pi}{4}\right))$

Sec 5.6: Right Triangle Trigonometry

- ✓ Be able to solve a right triangle.
- ✓ Know the trig ratios and how to use them.
- ✓ Be able to solve real-world problems.

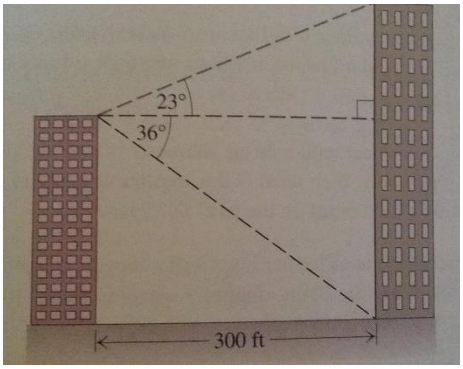
Problems to try:

4. From the book: pg 427: 65, 67, 102

Solve each right triangle with the given parts.

65. $a = 2, b = 3$ 67. $a = 3.2, \alpha = 21.3°$

102. Two buildings are 300 ft. apart. From the top of the shorter building, the angle of elevation of the top of the taller building is $23°$, and the angle of depression of the base of the taller building is $36°$, as shown in the figure. How tall is each building?



Sec 7.1: The Law of Sines

- ✓ Be able to solve non-right triangles using the law of sines.
- ✓ Be able to determine the number of triangles and find the triangles.
- ✓ Be able to solve real-world problems involving bearings.

Problems to try:

5. From the book: pg 571: 1, 3, 7, 9, 11 pg 573: 97

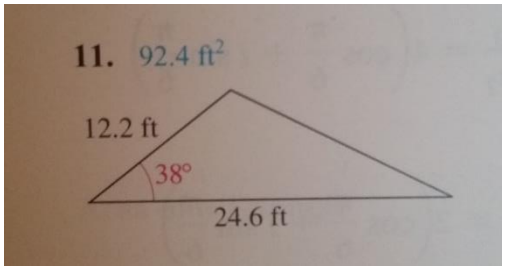
Solve each triangle that exists with the given parts. If there is more than one triangle with the given parts, then solve each one.

1. $\gamma = 48°, a = 3.4, b = 2.6$ 3. $\alpha = 13°, b = 8, c = 10$ 7. $a = 30.6, b = 12.9, c = 24.1$

9. $\beta = 22°, c = 4.9, b = 2.5$

Find the area of the triangle.

11.



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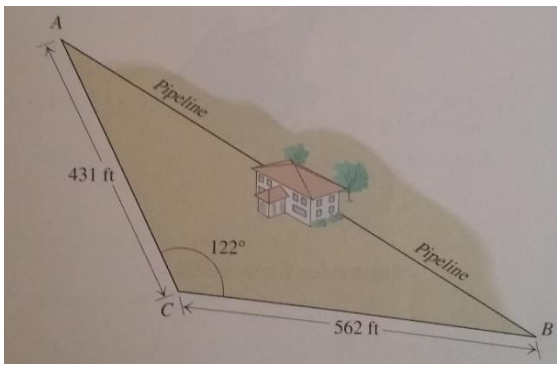
97. A pipeline was planned to go from A to B, as shown in the figure. However, Mr. Smith would not give permission for the pipeline to cross his property. The pipeline was laid 431 ft. from A to C and then 562 ft. from C to B. If $< C$ is $122°$ and the cost of the pipeline was \$21.60/ft., then how much extra was spent to go around Mr. Smith's property?



Sec 7.2: The Law of Cosines

- ✓ Be able to solve non-right triangles using the law of cosines.
- ✓ Know how to find the area of a triangle using Heron's Area Formula.
- ✓ Be able to solve triangles using law of sines and cosines.
- ✓ Be able to solve real-world problems.

Problems to try:

6. From the book: Same as #7

Sec 7.3: Vectors

- ✓ Be able to find component form of vectors, the magnitude and angle of vectors, the magnitude and angle between two vectors and between resultant vectors, be able to add, subtract, and do scalar multiplication, and be able to find the dot product of vectors.

Problems to try:

7. From the book: pg 572: 15-35 odd

Find the magnitude of the horizontal and vertical components for each vector v with the given magnitude and given direction angle θ.

15. $|v| = 6, \theta = 23.3°$ 17. $|v| = 3.2, \theta = 231.4°$

Find the magnitude and direction for each vector.

19. $\langle 2,3 \rangle$ 21. . $\langle -3.2, -5.1 \rangle$

Find the component form for each vector v with the given magnitude and direction angle.

23. $|v| = \sqrt{2}, \theta = 45°$ 25. $|v| = 9.1, \theta = 109.3°$

Perform the operations. Write your answer in the form $\langle a, b \rangle$ if the answer is a vector.

27. $2\langle -3,4 \rangle$ 29. $\langle 2, -5 \rangle - 2\langle 1,6 \rangle$ 31. $\langle -1,5 \rangle \cdot \langle 4,2 \rangle$

Rewrite each vector v in the form $a_1\boldsymbol{i} + a_2\boldsymbol{j}$, where $\boldsymbol{i} = \langle 1,0 \rangle$ and $\boldsymbol{j} = \langle 0,1 \rangle$.

33. In component form, $v = \langle -4,8 \rangle$. 35. The direction angle for v $30°$ and its magnitude is 7.2.

Sec 7.6: Polar Coordinates

- ✓ Plot polar coordinates
- ✓ Convert points from polar to rectangular points and vice versa.
- ✓ Convert polar equations to rectangular equations and vice versa.

Problems to try:

8. From the book: pg 573: 81-87 odd

For each polar equation, write an equivalent rectangular equation.

81. $r = \frac{1}{sin\theta + cos\theta}$ 83. $r = -5$

For each rectangular equation, write an equivalent polar equation.

85. $y = 3$ 87. $x^2 + y^2 = 49$