

# 11<sup>th</sup> Grade Assignment – Week #8

Group Assignment: For Tuesday and Thursday

- Together, work on the word problems from **Problem Sets #5 and #6** from the unit **Trigonometry – Part II**.

Individual Work

- Finish the rest of the problems from **Problem Sets #5 and #6** from the unit **Trigonometry – Part II**.
- Begin to prepare for a test on Trigonometry. Be sure you especially understand everything on Problem Sets #4, 5, 6.

## Problem Set #5





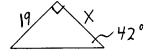


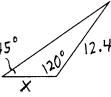


1) Without the use of a calculator, give the answer either as an estimate or, if possible, give an exact answer.

- |                      |                      |
|----------------------|----------------------|
| a) $\tan(60^\circ)$  | l) $\cos(25^\circ)$  |
| b) $\sin(60^\circ)$  | m) $\cos(90^\circ)$  |
| c) $\tan(25^\circ)$  | n) $\tan(90^\circ)$  |
| d) $\cos(30^\circ)$  | o) $\sin(0^\circ)$   |
| e) $\sin(45^\circ)$  | p) $\sin(65^\circ)$  |
| f) $\tan(30^\circ)$  | q) $\sin(90^\circ)$  |
| g) $\cos(60^\circ)$  | r) $\cos(45^\circ)$  |
| h) $\cos(0^\circ)$   | s) $\tan(55^\circ)$  |
| i) $\sin(25^\circ)$  | t) $\sin(150^\circ)$ |
| j) $\sin(125^\circ)$ | u) $\cos(55^\circ)$  |
| k) $\tan(0^\circ)$   | v) $\tan(45^\circ)$  |

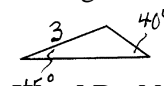
2) Without the use of a calculator, give the answer either as an estimate or, if possible, give an exact answer.

- |                                    |                                    |
|------------------------------------|------------------------------------|
| a) $\sin^{-1}(1/2)$                | l) $\cos^{-1}(1/4)$                |
| b) $\cos^{-1}(\frac{\sqrt{2}}{2})$ | m) $\sin^{-1}(1)$                  |
| c) $\sin^{-1}(1/4)$                | n) $\sin^{-1}(0)$                  |
| d) $\cos^{-1}(0)$                  | o) $\tan^{-1}(\frac{\sqrt{3}}{3})$ |
| e) $\sin^{-1}(\frac{\sqrt{2}}{2})$ | p) $\cos^{-1}(1/2)$                |
| f) $\cos^{-1}(0.8)$                | q) $\cos^{-1}(0.1)$                |
| g) $\tan^{-1}(\sqrt{3})$           | r) $\cos^{-1}(\frac{\sqrt{3}}{2})$ |
| h) $\tan^{-1}(1)$                  | s) $\tan^{-1}(1/4)$                |
| i) $\tan^{-1}(1/2)$                | t) $\tan^{-1}(4)$                  |
| j) $\sin^{-1}(\frac{\sqrt{3}}{2})$ | u) $\cos^{-1}(1)$                  |
| k) $\tan^{-1}(0)$                  | v) $\sin^{-1}(4)$                  |

3) Find the variable indicated.

- |  |  |
|--|--|
| a)    | f)    |
| b)    | g)    |
| c)   | h)   |
| d)  | i)  |
| e)  | j)  |

4) Find all the missing sides and angles.



### Word Problems

- 5) A plane takes off and climbs at a constant angle of inclination of  $12^\circ$ . What is the elevation of the plane after it has flown 20 miles (in the air)?
- 6) To calculate the width of a river, Larry starts by standing on the shore directly opposite from a tree (on the opposite shore). Then he walks a distance of 100m along the shore (assume that it is a straight line), and from there he measures that from the tree to where he is standing forms a  $73^\circ$  angle with the shore. What is the width of the river?

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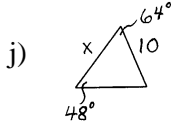
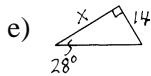
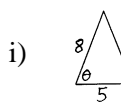
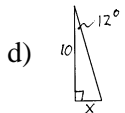
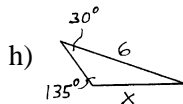
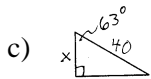
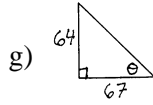
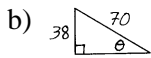
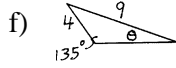
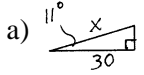
- 7) The ratio of the lengths of the sides of a golden rectangle is  $\Phi:1$ , where  $\Phi = \frac{\sqrt{5}+1}{2}$ .

Calculate the angle formed by the diagonal and the shortest side.

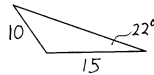
- 8) There are two fire towers where one is 12 miles to the north of the other. A fire is spotted in the forest that is S43°E (43° east of south) from the north tower, and N52°E from the south tower. What is the distance from the fire to the closer fire tower?

## Problem Set #6

- 1) Find the variable indicated.



- 2) Find all the missing sides and angles.



### Word Problems

- 3) What is the length of the shadow of a 25-foot tall pole if the angle of elevation of the sun is 30°? (Assume that the ground is flat.)
- 4) How tall is a pole with a 35-foot shadow if the angle of elevation of the sun is 25°?
- 5) A 18-foot tall pole casts a 15½-foot shadow. What is the angle of elevation of the sun?
- 6) Calculate the length of the longest diagonal of a regular heptagon (7-gon) that has sides of length 1.
- 7) The Great Pyramid of Giza was built with a base length of 756 feet and an overall height of 481 feet.
- What is the angle of inclination of the triangular faces?
  - What is the length of the edge coming down from the peak of the pyramid?
  - What are the base angles of the triangular faces of the pyramid? (Where else have you seen this angle?)
- 8) The Tower of Pisa now stands about 4.0° off vertical. If the sun is opposite the direction of the leaning and at a 55° angle of elevation, then the shadow (measured from the side of the tower) would be about 43.0m long. How high above the ground is the low side of the tower? (Assume the tower is a cylinder.)