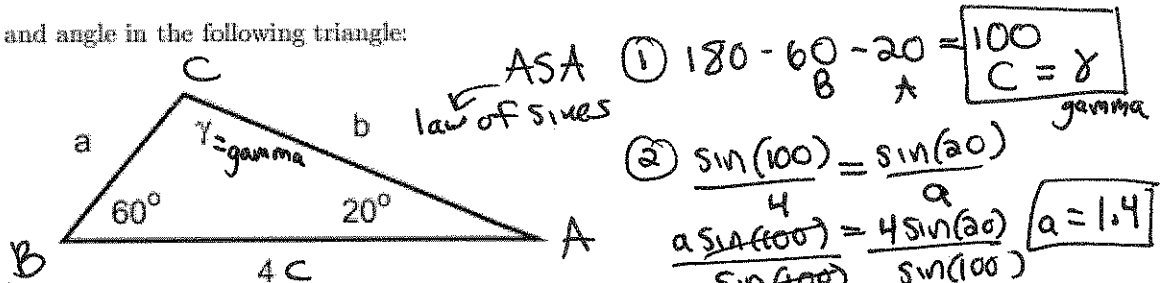


Unit 5 Test Review – Common Core Math 2 Honors

1. Find the remaining sides and angle in the following triangle:

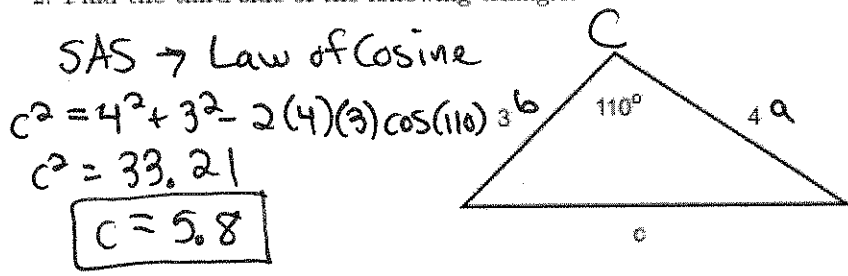


①  $180 - 60 - 20 = 100$   
 $C = \gamma$

②  $\frac{\sin(100)}{4} = \frac{\sin(20)}{a}$   
 $a \sin(100) = 4 \sin(20)$   
 $\frac{a \sin(100)}{\sin(100)} = \frac{4 \sin(20)}{\sin(100)}$   
 $a = 1.4$

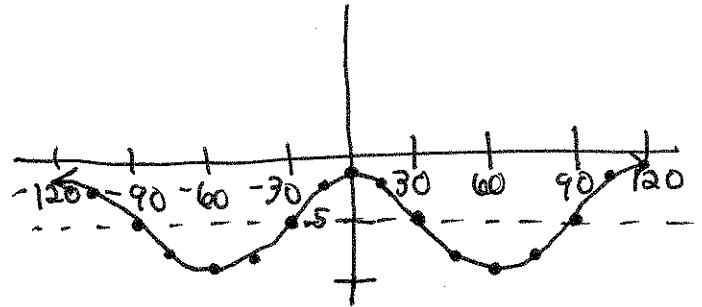
③  $\frac{\sin(100)}{4} = \frac{\sin(60)}{b}$   
 $b \sin(100) = 4 \sin(60)$   
 $\frac{b \sin(100)}{\sin(100)} = \frac{4 \sin(60)}{\sin(100)}$   
 $b = 3.5$

2. Find the third side of the following triangle:

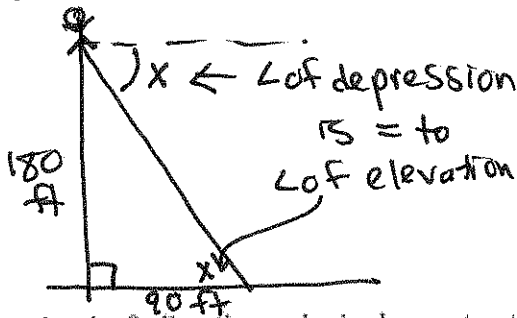


3. For the function  $y = -5 + 4 \cos(3x) \Rightarrow y = 4 \cos(3x) - 5$

- a. The amplitude.  $|4| = 4 = |a|$
- b. The period.  $per = 360/3 = 120^\circ = 360/b$
- c. The equation of the midline.  $y = -5 = d$
- d. Graph 1 period in the negative and positive directions.



4. A building 180 feet tall casts a 90 foot long shadow. If a person looks down from the top of the building, what is the measure of the angle of depression? (Assume the person's eyes are level with the top of the building.)



$\tan(x) = \frac{180}{90}$

$x = \tan^{-1}\left(\frac{180}{90}\right)$

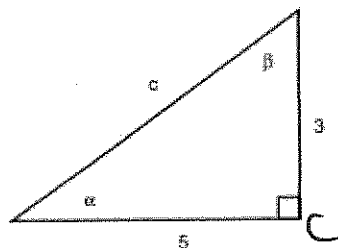
$x = 63.4^\circ$

5. Solve the right triangle, finding the angles in degrees to at least 3 decimal places.

①  $\tan(\alpha) = \frac{3}{5}$

$\alpha = \tan^{-1}(3/5)$

$\alpha = 30.964^\circ$



②  $180 - 90 - 30.964 = \beta$

$\beta = 59.036^\circ$

③ Pythagorean Thm.

$3^2 + 5^2 = c^2$

$\sqrt{34} = c$

$c = 5.831$

6.

A. Find  $\cos \theta$

$\cos \theta = \frac{5\sqrt{2}}{5\sqrt{3}} = \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{2} \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{6}}{3}$

$\cos \theta = .816$

B. Find  $\sin \theta$

$\sin \theta = \frac{5}{13}$

C. Find  $\tan \theta$

$6^2 + y^2 = 9^2$   
 $y^2 = 45$   
 $y = 3\sqrt{5}$

$\tan \theta = \frac{6}{3\sqrt{5}} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

D. Find  $\sin \theta$

$7^2 + x^2 = 25^2$   
 $x = 24$

$\sin \theta = \frac{7}{25} = \frac{24}{25}$

7. A person is standing 30 meters from a traffic light. If the angle of elevation from the person's feet to the top of the traffic light is 25 degrees, find the height of the traffic light.

$\tan(25) = \frac{x}{30}$   
 $x = 30 \tan(25) = 13.989 \approx 14 \text{ m}$

8. Find all solutions to  $2 \sin 2x + 1 = 0$  for  $0 \leq x \leq 2\pi$ .

$2 \sin 2x = -1$   
 $\sin 2x = -1/2$

$2x = \sin^{-1}(-1/2)$   
 $2x = -30$   
 $x = -15$

9. From the top of a fence, a person sites a lion on the ground at an angle of depression of 24 degrees. If the man and the fence is 4.2 meters high, how far is the man from the lion?

$\sin(24) = \frac{4.2}{x}$   
 $x \sin(24) = 4.2$   
 $x = \frac{4.2}{\sin(24)} = 10.3 \text{ m}$

10. Find the measure of angle A, to the nearest degree, if  $\sin A = .9659258$ .

$A = \sin^{-1}(.9659258)$   
 $A = 75^\circ$

11. A ship leaves port at 1 pm traveling north at the speed of 30 miles/hour. At 3 pm, the ship adjusts its course on a bearing of N 20° E. How far is the ship from the port at 4 pm?

1st:  $2 \text{ hrs} \times \frac{30 \text{ mi}}{\text{hr}} = 60 \text{ mi}$

2nd:  $1 \text{ hr} \times \frac{30 \text{ mi}}{\text{hr}} = 30 \text{ mi}$

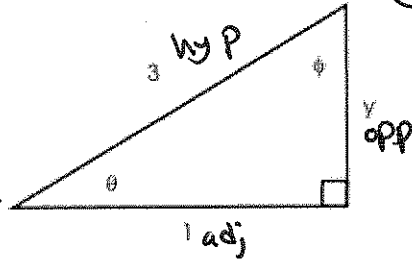
3rd: SAS  $\rightarrow$  Law of Cos  
 $x^2 = 60^2 + 30^2 - 2 \cdot 60 \cdot 30 \cos(160)$   
 $x^2 = 4500 - 3600 \cos(160)$   
 $x^2 = 7882.89$   
 $x = 88.79 \text{ miles}$

12. Find the approximate value of  $\tan 735$ .

$.2679$

13. Solve the right triangle

① Pyth Thm  
 $1^2 + y^2 = 3^2$   
 $1 + y^2 = 9$   
 $y^2 = 8$   
 $y = \sqrt{8} = \sqrt{4 \cdot 2}$   
 $y = 2\sqrt{2}$

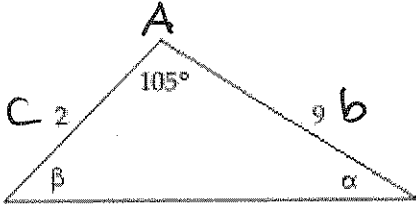


②  $\cos \theta = \frac{1}{3}$   
 $\theta = \cos^{-1}(\frac{1}{3})$   
 $\theta = 70.5^\circ$

③  $180 - 90 - 70.5 = \phi$   
 $19.5 = \phi$

Find the area of the triangle. If necessary, round the answer to two decimal places.

17)



Area =  $\frac{1}{2} \text{side} \cdot \text{side} \cdot \sin(\text{included angle})$  or  $\frac{1}{2} bc \sin A$   
 $= \frac{1}{2} (2)(9) \sin(105)$

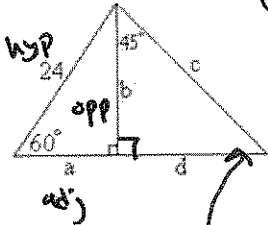
A) 2.33

B) 8.69

C) 101.42

D) 34.77

23. In the diagram below, find the approximate value of each part labeled with a variable. Show all work.



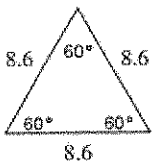
①  $\cos(60) = \frac{a}{24}$   
 $a = 24 \cos(60)$   
 $a = 12$

②  $\sin(60) = \frac{b}{24}$   
 $b = 24 \sin(60)$   
 $b = 20.78$

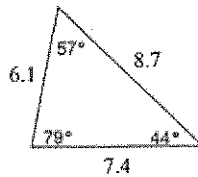
④  $b = d$  because isosceles  $\Delta$   
 $d = 20.78$   
 ⑤  $(20.78)^2 + (20.78)^2 = c^2$   
 $\sqrt{864} = \sqrt{c^2}$   
 $c = 29.39$

③  $180 - 90 - 45 = 45^\circ$

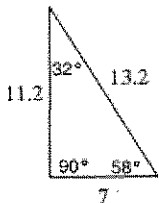
24. Classify each triangle by its sides and its angles:



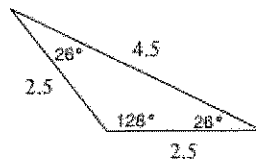
equilateral  
equiangular  $\Delta$



Scalene  
acute  $\Delta$



Scalene  
right  $\Delta$



isosceles  
obtuse  $\Delta$

