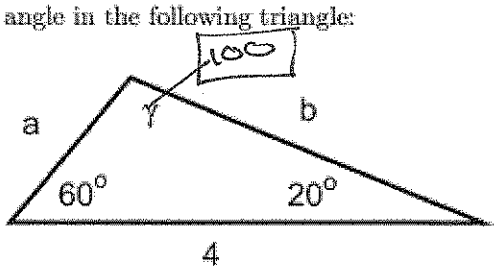
Answer key

Unit 5 Test Review – Common Core Math 2 Honors

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



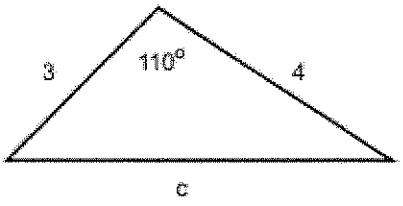
$\frac{\sin 100}{4} = \frac{\sin 20}{a}$

$a = 1.4$

$\frac{\sin 100}{4} = \frac{\sin 60}{b}$

$b = 3.5$

2. Find the third side of the following triangle:

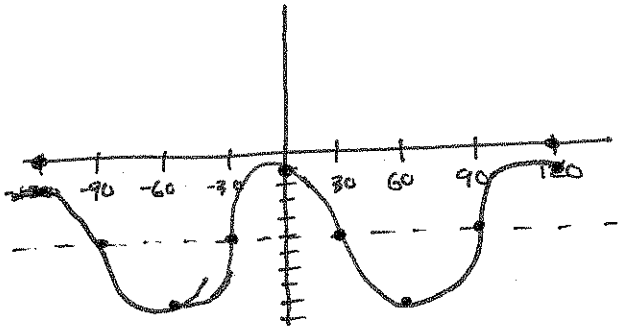


$c^2 = 4^2 + 3^2 - 2(4)(3)\cos 110$

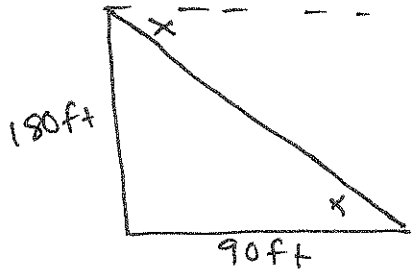
$c = 5.8$

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

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



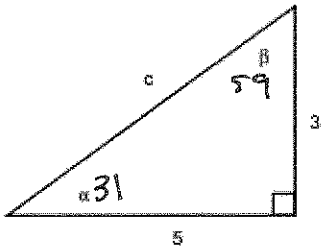
4. A building 180 feet tall casts a 90 foot long shadow. If a person looks down from the top of the building, what is the measure of the angle of depression? (Assume the person's eyes are level with the top of the building.)



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

$x = 63.4°$

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



$\tan\alpha = \frac{3}{5}$

$a = 30.96$

$\tan\beta = \frac{5}{3}$

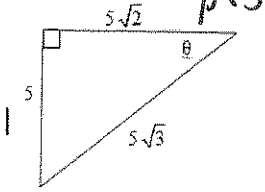
$\beta = 59$

$\cos 31 = \frac{5}{c}$

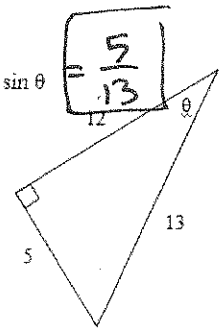
$c = 5.8$

6.

A. Find $\cos\theta$ $= \frac{5\sqrt{2}}{5\sqrt{3}} = \boxed{\frac{\sqrt{2}}{\sqrt{3}}}$



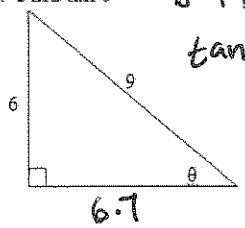
B. Find $\sin\theta$ $= \boxed{\frac{5}{13}}$



C. Find $\tan\theta$ $6^2+b^2=9^2$

$\tan\theta = \boxed{\frac{6}{6.7}}$

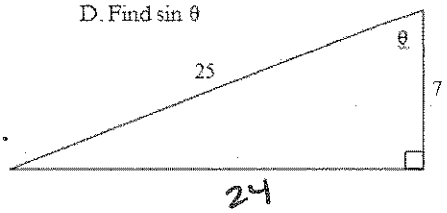
$= .896\ldots$



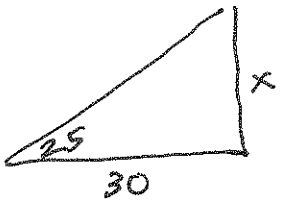
D. Find $\sin\theta$ $7^2+b^2=25^2$

$b=24$

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



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.



$\tan 25 = \frac{x}{30}$

$\boxed{x = 14\text{ m.}}$

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

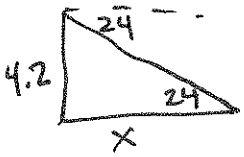
$-1 \quad -1$

$\sin 2x = \frac{-1}{2}$

$2x = -30$

$\boxed{x = -15}$

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?



$\tan 24 = \frac{4.2}{x}$

$\boxed{x = 9.4\text{ meters}}$

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

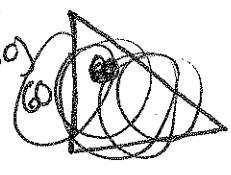
$\sin^{-1}(.9659258)$

$\boxed{A = 75°}$

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 20º E. How far is the ship from the port at 4 pm?

$x^2 = 30^2 + 60^2 - 2(30)(60)\cos(60)$

$\boxed{x = 88.8\text{ mi}}$

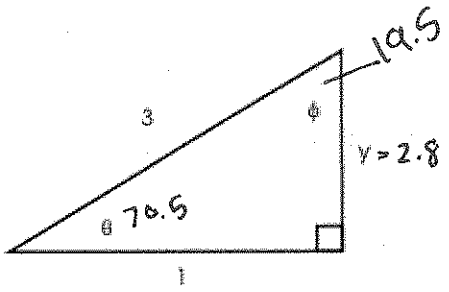


12. Find the approximate value of tan 735.

$= .2679\ldots$

$180 - 70.5 - 90 = 19.5$

13. Solve the right triangle



$\cos\theta = \frac{1}{3}$

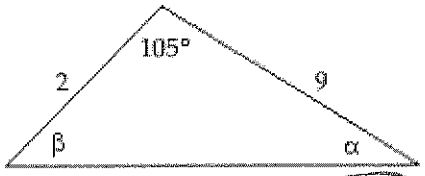
$\theta = 70.5$

$\tan 70.5 = \frac{y}{1}$

$y = 2.8$

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

17)



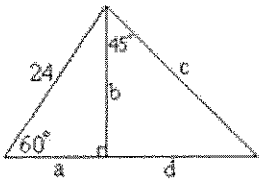
$A = \frac{1}{2}bc\sin A$

$A = \frac{1}{2} \cdot 9 \cdot 2 \cdot \sin 105$

$A = 8.69$

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.



$\sin 60 = \frac{b}{24}$

$b = 20.8$

$\cos 60 = \frac{a}{24}$

$a = 12$

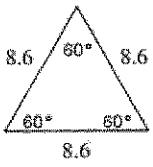
$\tan 45 = \frac{d}{20.8}$

$d = 20.8$

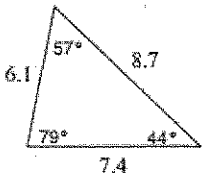
$\sin 45 = \frac{20.8}{c}$

$c = 29.4$

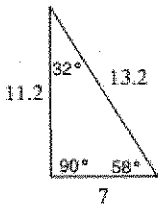
24. Classify each triangle by its sides and its angles:



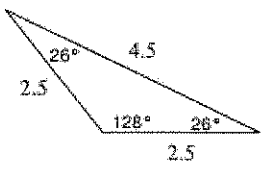
Equiangular
Equilateral



Acute
scalene

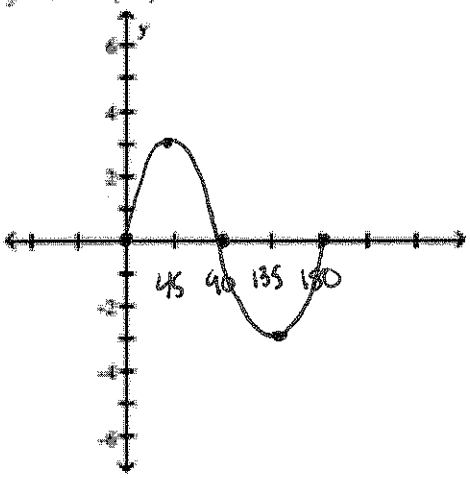


Right
scalene



Obtuse
isosceles

25. $y = 3\sin(2x)$



a. Find the midline. $y = 0$
b. Find the amplitude. 3
c. Find the period. 180°
d. Graph one cycle

26. $\sin x \cos x \tan x + \sin x \cos x = 0$

$\sin\cos(\tan x + 1) = 0$

$\sin x = 0 \quad \cos x = 0 \quad \tan x + 1 = 0$

$x = 0, 90, -45$

27. $2\cos x(\cos x + \frac{1}{2}) = 0$

$2\cos x = 0 \quad \cos x + \frac{1}{2} = 0$

$x = 90, 120$

28. $2\cos x + 1 = 2$

$-1 \quad -1$

$\cos x = \frac{1}{2}$

$x = 60$

29. Find sin (15) and cos (75). Why is there something special about their values?

$15 + 75 = 90^\circ \rightarrow$ The angles are complementary so their ratios ($\sin 15^\circ$ & $\cos 75^\circ$) are the same.