

Advanced Algebra
Unit 9 Parametric Right Triangle Trig
Assignment #20 Review

#2

- 1) A ship leaves a port on a bearing of 47 degrees traveling at 32 miles per hour.
 - a) Draw the right triangle and write your parametric trig equations
 - b) After how many hours is the horizontal distance 578 miles
 - c) What is the y distance during this time
 - d) Hence, what is the total distance.
- 2) A car drives off of a 300 foot cliff while traveling 56 feet per second.
 - a) What is the x equation?
 - b) What is the y equation
 - c) How long is the car in the air
 - d) How far did it travel during this time.
- 3) Draw the picture in the proper quadrant for the angle that terminates at (-3,7)
 - a) What are the sin, cos and tangent
 - b) what is angle θ
 - c) What is the big angle?
- 4) An airplane takes off at an angle of 14 degrees. The speed of the airplane is 195 feet per second.
 - a) draw the right triangle
 - b) What are the sine and cosine equations
 - c) What is the height of the plane after 20 seconds
 - d) What is the horizontal distance after 20 seconds.

For Problems 5 and 6 either use the law of sines or the law of cosines or both to find the missing sides and angles. Completely solve the triangle.

Law of sines $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Law of Cosines $a^2 = b^2 + c^2 - 2(b)(c)\cos A$

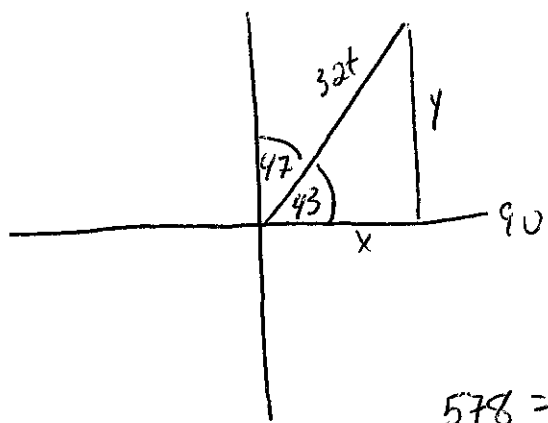
- 6) In triangle ABC, $A=25^\circ$, $B=55^\circ$ and $b=18$

Angle C= _____

a= _____

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①



$$y = 32t \cdot \sin 43$$

$$x = 32t \cdot \cos 43$$

$$578 = 32t \cdot \cos 43$$

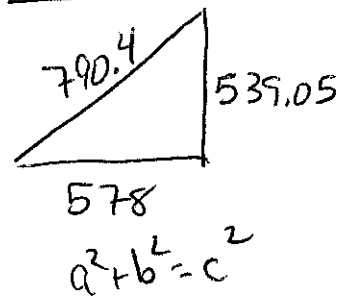
$$t = 24.7 \text{ hours}$$

c) $y = 32(24.7) \cdot \sin 43$
 $y = 539.05$

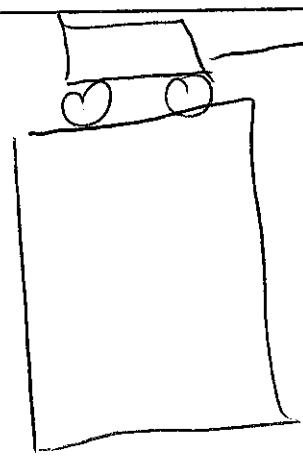
d) Total distance

Method #1
 $32(24.7)$
 790.4

Method #2



②



$$x = 56t$$

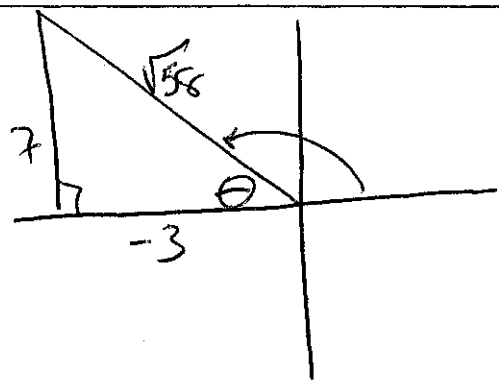
$$y = -16t^2 + 300$$

$$0 = -16t^2 + 300$$

$$t = 4.3 \text{ seconds}$$

$$x = 56(4.3) \quad \boxed{240.8 \text{ feet}}$$

③



$$\sin \theta = \frac{7}{\sqrt{58}}$$

$$\cos \theta = \frac{-3}{\sqrt{58}}$$

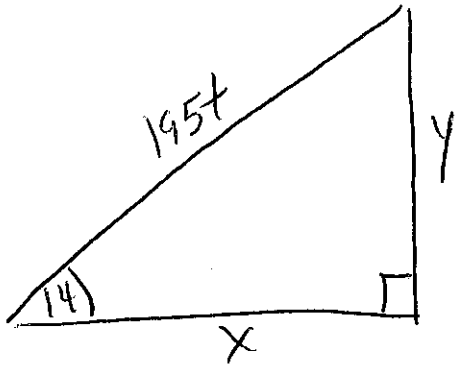
$$\tan \theta = \frac{-7}{3}$$

$$\theta = 66.9$$

$$\phi = 113.1^\circ$$

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$$y = 195 \cdot \sin 14$$

$$x = 195 \cdot \cos 14$$

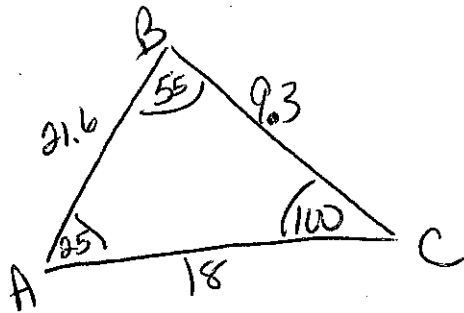
$$y = 195(20) \cdot \sin 14$$

$$x = 195(20) \cdot \cos 14$$

$$943.5 \text{ Feet}$$

$$3784.2 \text{ Feet}$$

5



$$180 - (55 + 25) = 100$$

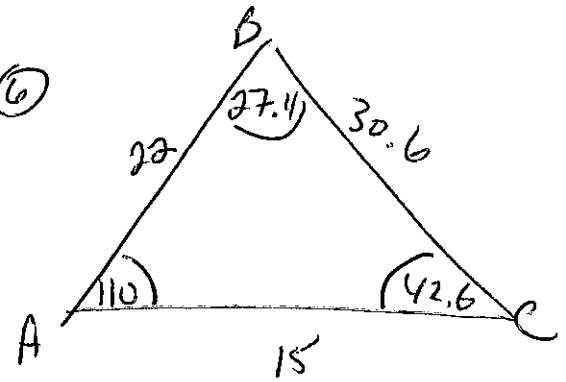
$$\frac{\sin 100}{c} = \frac{\sin 55}{18}$$

$$c = 21.6$$

$$\frac{\sin 25}{a} = \frac{\sin 55}{18}$$

$$a = 9.3$$

6



$$a^2 = 22^2 + 15^2 - 2(22)(15)\cos 110$$

$$a = 30.6$$

$$\frac{\sin B}{15} = \frac{\sin 110}{30.6}$$

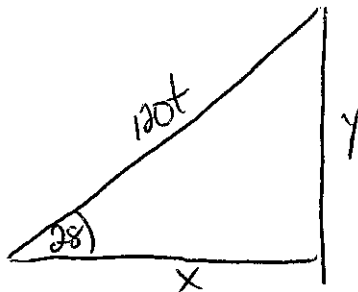
$$\angle B = 27.4^\circ$$

$$\angle C =$$

$$180 - (110 + 27.4) = 42.6$$

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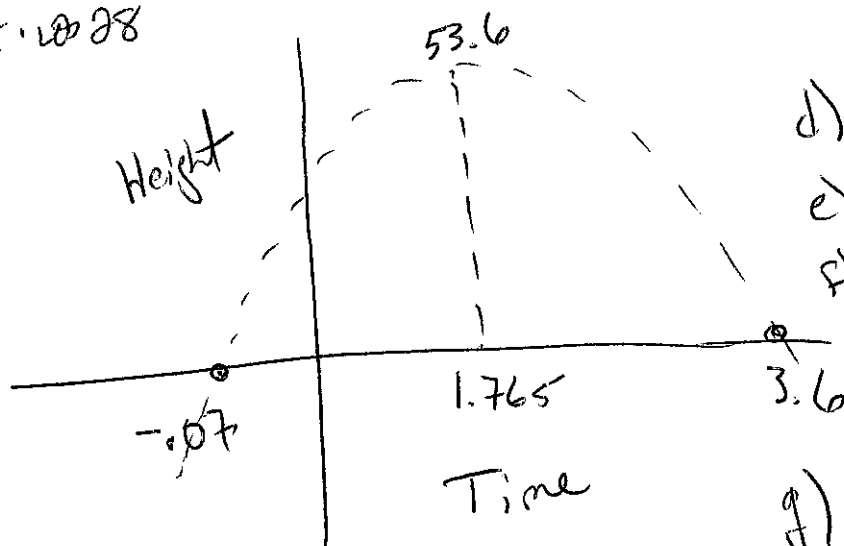


$$c) y = -16t^2 + 120t \cdot \sin 28 + 4$$

$-0.07 \text{ AND } 3.6$

b) $y = 120t \cdot \sin 28$

$x = 120t \cdot \cos 28$



d) 3.6 seconds

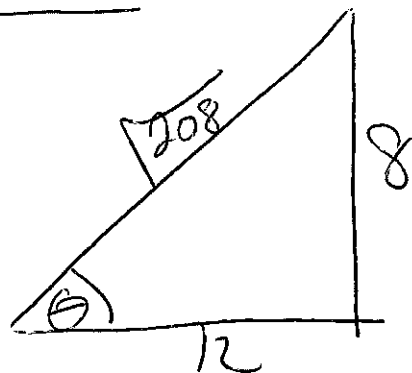
e) 53.6 feet

f) 1.765 seconds

g) $x = 120(3.6) \cos 28$

$x = 381.4 \text{ feet}$

8



$$\cot = \frac{12}{8} \text{ so } \tan = \frac{8}{12}$$

$$\sin \theta = \frac{8}{\sqrt{208}} \quad \csc \theta = \frac{\sqrt{208}}{8}$$

$$\cos \theta = \frac{12}{\sqrt{208}} \quad \sec \theta = \frac{\sqrt{208}}{12}$$

$$\tan \theta = \frac{8}{12} \quad \cot \theta = \frac{12}{8}$$