Name_____

Date_____

Unit 9: Assignment #22 Chapter 9 Review #3

1) A ship is on a bearing of 130°. It is traveling at a speed of 20 knots (a knot is around 1.15 miles per hour). After how many hours is the ship 600 miles east of where it started from? What is the total distance that the ship traveled? Don't forget to convert knots to MPH

Final answer. Round to the nearest hour.

34.1 hours

Total distance. Round to the nearest mile.

784.3 Miles

2) At a certain time of the day, the angle of elevation of the sun is 18°. Find the length of the shadow cast by a building 50 meters high.

Final answer to Length of the shadow to the nearest meter.

153.9 Meters

3) A car is traveling 65 feet per second. They drive straight off a cliff. The height of the cliff is 900 feet. Don't worry, the car was remote controlled so nobody was injured in this incident. How long was the car in the air. How far did it travel from the base of the cliff?

How long was car in the air? Round to the tenths place.

7.5 seconds

Horizontal distance traveled? Round to the nearest foot.

487.5 feet

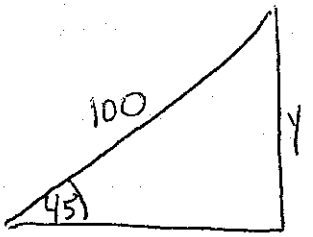
4) A projectile is shot in the air at 108 feet per second at an angle of 25°. The starting height was 10 feet. How long was this projectile in the air? How far did the projectile travel?

Final answer: How long was projectile in the air? Round to the hundredths place.

3.06 seconds

Final answer :Horizontal distance traveled. Round to the nearest foot.

300 feet



$\sin 45 = \frac{y}{100}$

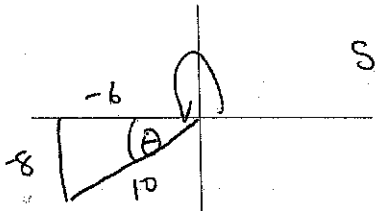
$y = 70.7$ ft

5) Beth is flying a kite on a 100-foot string. The string makes a 45 degree angle with the ground. How high above the ground is the kite?

6) Draw a picture for the given angle ϑ that has a terminal side as the given point. State the sin, cos, and tangent and state the reference angle and the big angle (from the x axis)

(-6,-8)

$6^2 + 8^2 = 10$

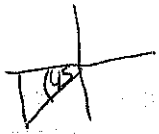


$\sin^{-1}\left(\frac{8}{10}\right) = 53.1°$

$180 + 53.1 = 233.1°$

7) Draw a picture of the angle, make the reference angle and state the exact value of the following.

a) Cos 225° $-\frac{\sqrt{2}}{2}$



b) sin 120° $\frac{\sqrt{3}}{2}$

c) tan 315°

For the following problems, draw the triangle, label it, and either use law of cosines or law of sines(or both) to completely solve the triangle)

8) a=13 b=30 and c=40

9) A=80° B=30° and b=14

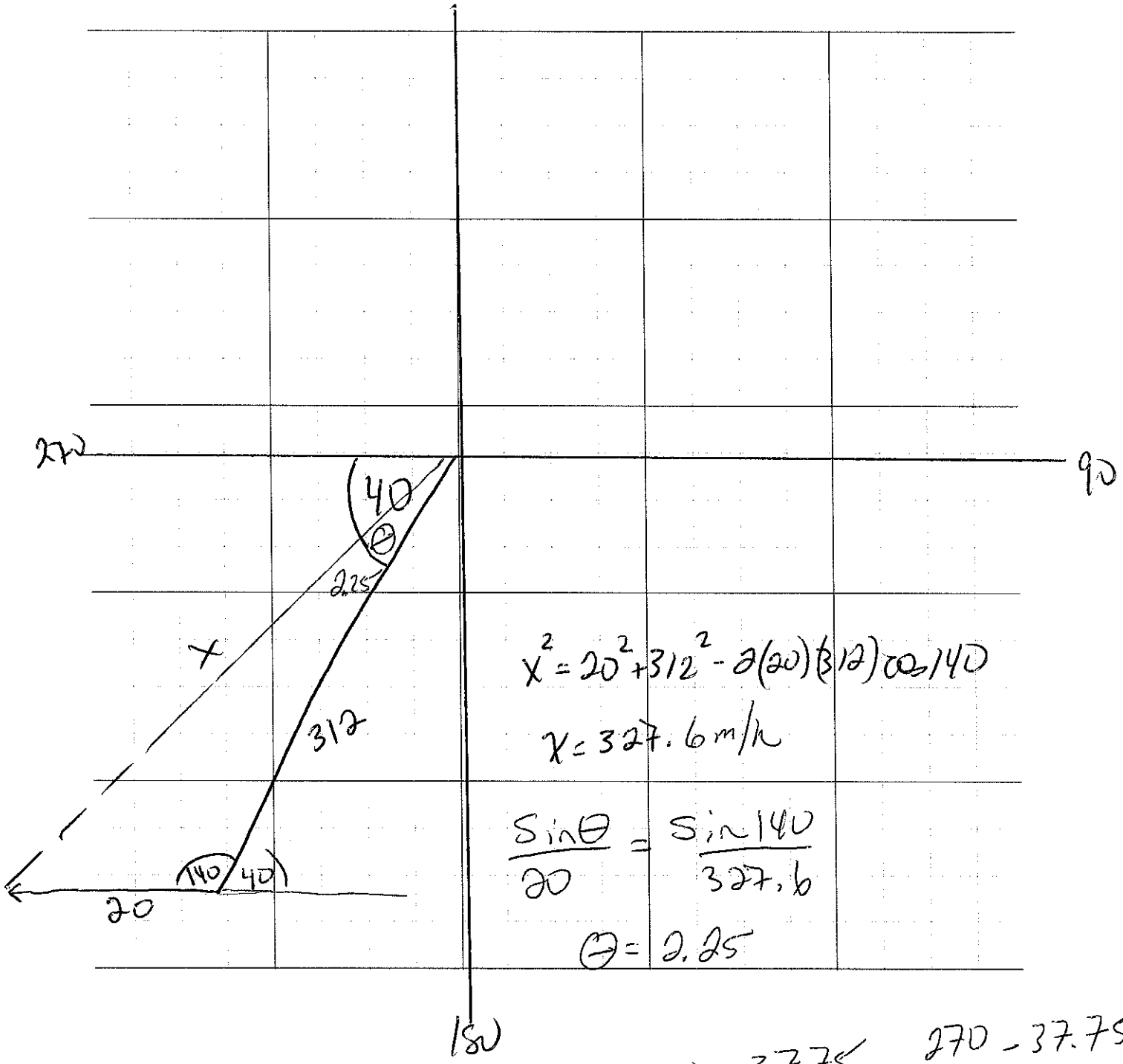
I can solve basic Trig Equations. State all the possible answers:

10) $\cos\vartheta = \frac{\sqrt{2}}{2}$

11) $\sin\vartheta = \frac{\sqrt{3}}{2}$

12) $\tan\vartheta = -1$

13)A plane is traveling at 312mph with a bearing of 230°. There is a 20mph wind blowing from the East. What is the final bearing and the ground speed of the plane?



$x^2 = 20^2 + 312^2 - 2(20)(312)\cos 140$

$x = 327.6 \text{ m/h}$

$\frac{\sin\theta}{20} = \frac{\sin 140}{327.6}$

$\theta = 2.25$

$40 - 2.25 = 37.75$ $\quad 270 - 37.75$

Final speed rounded to the nearest tenth.	Final bearning rounded to the nearest tenth.
327.6	232.25°

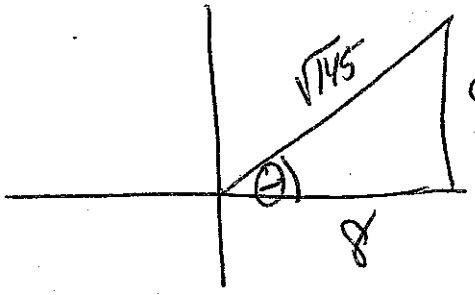
I know the basic reciprocal trig functions:

For the following problems, draw the proper right triangle and state all 6 trig functions for each.

14) Given $\cot\vartheta=\frac{12}{8}$

15) $\csc\vartheta=\frac{\sqrt{145}}{9}$

so $\sin\theta=\frac{9}{\sqrt{145}}$



$\sin\theta=\frac{9}{\sqrt{145}}$ $\quad \csc\theta=\frac{\sqrt{145}}{9}$

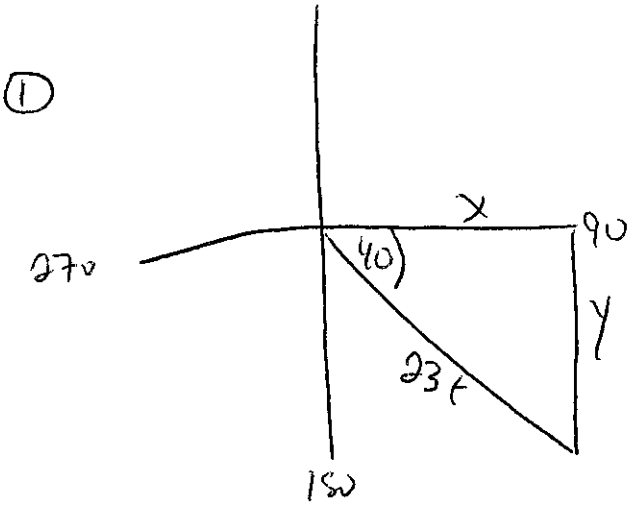
$\cos\theta=\frac{8}{\sqrt{145}}$ $\quad \sec\theta=\frac{\sqrt{145}}{8}$

$\tan\theta=\frac{9}{8}$ $\quad \cot\tan=\frac{8}{9}$

16) $\sec\vartheta=\frac{5}{3}$

Unit 9 Assignment #22 Review #3

①



20×1.15

23 mph

$\frac{1 \text{ knot}}{1.15 \text{ m/}} = \frac{20 \text{ kn}}{x}$

$x = 23t \cdot \cos 40$

$600 = 23t \cdot \cos 40$

$34.1 = t$

$y = 23t \cdot \sin 40$

$23(34.1) = 784.3$

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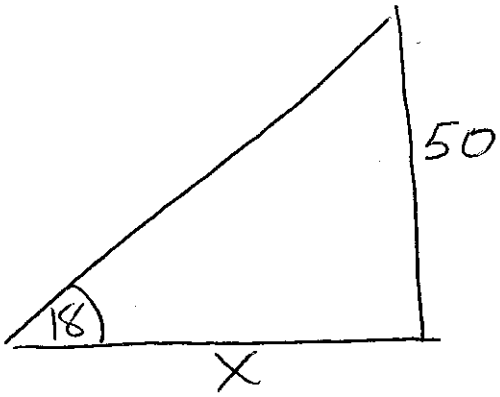
②



$\tan 18 = \frac{50}{x}$

$x = 153.9$ meters

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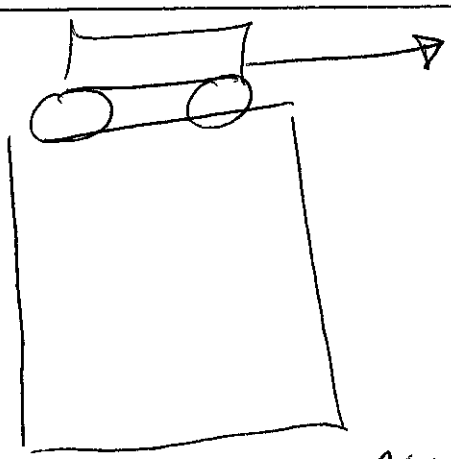
③



$x = 65t$

$y = -16t^2 + 900$

$0 = -16t^2 + 900$

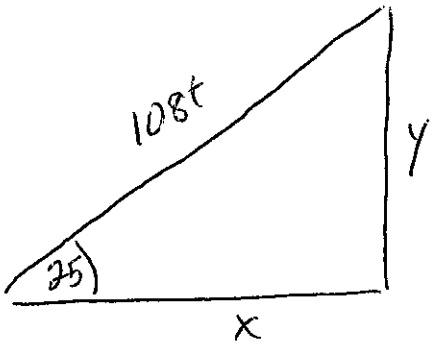
$t = 7.5$ sec

$x = 65(7.5)$

487.5 feet

Unit 9 Assignment #30 Review #3

(4)

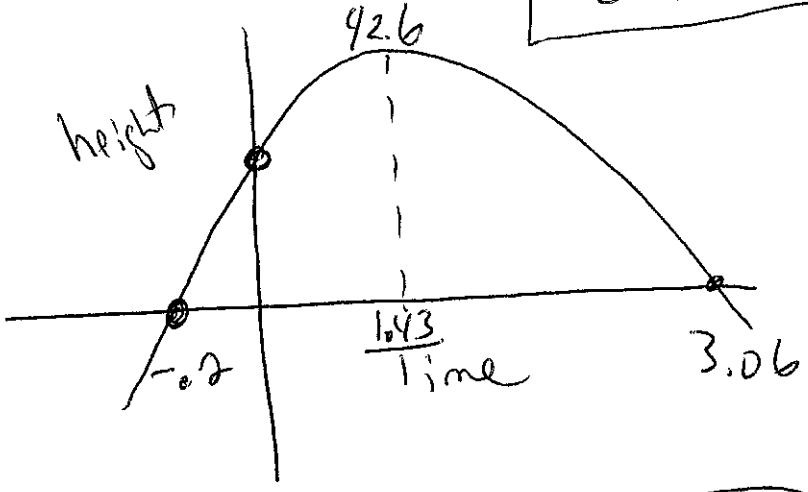


$y = -16t^2 + 108t \cdot \sin 25 + 10$

Q1=

$a = -16$
$b = 108 \sin 25$
$c = 10$

$\Rightarrow$ -.2, 3.06



VARS(1.43) 42.6 feet

$x = 108t \cdot \cos 25$

$108(3.06)\cos 25$

300 feet

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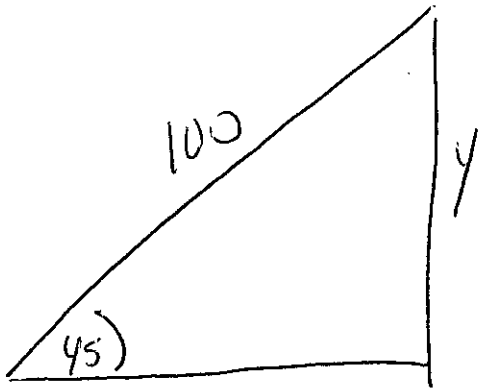
(5)

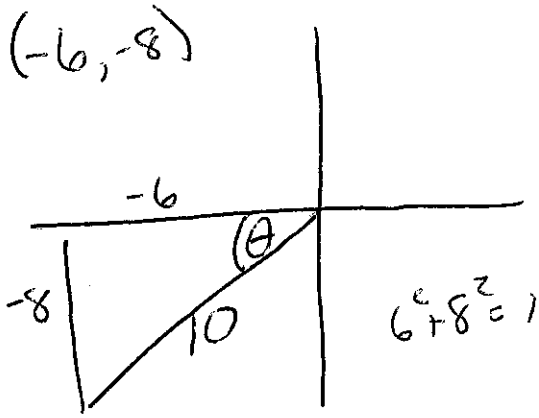


$\sin 45 = \frac{y}{100}$

$y = 70.7$ feet

Unit 9 Assignment #22 Review #3

(6) $(-6, -8)$



$6^2 + 8^2 = 10$

$\sin^{-1}\left(\frac{8}{10}\right) = \boxed{53.1^\circ}$

$180 + 53.1 = \boxed{233.1^\circ}$

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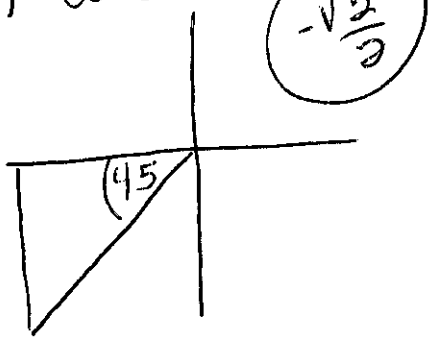
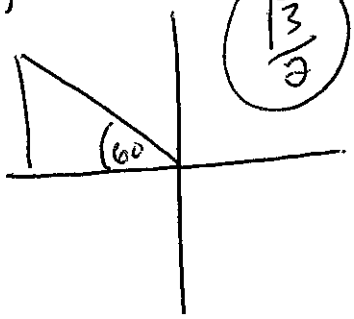
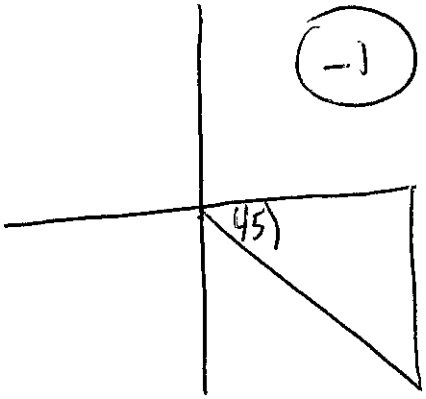
(7) a) $\cos 225$ $\quad \boxed{-\frac{\sqrt{2}}{2}}$



b) $\sin 120$ $\quad \boxed{\frac{\sqrt{3}}{2}}$



c) $\tan 315$ $\quad \boxed{-1}$



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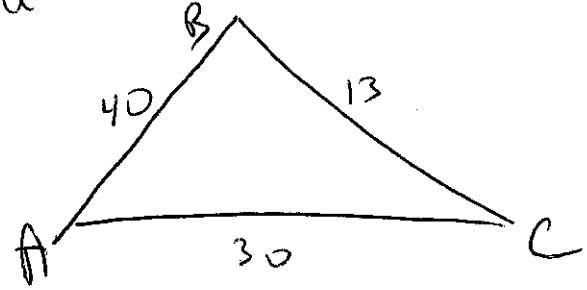
(8) $a = 13 \quad b = 30 \quad c = 40$



$13^2 = 40^2 + 30^2 - 2(40)(30)\cos A$ $\quad \boxed{\measuredangle A = 13.8^\circ}$

$40^2 = 30^2 + 13^2 - 2(30)(13)\cos C$

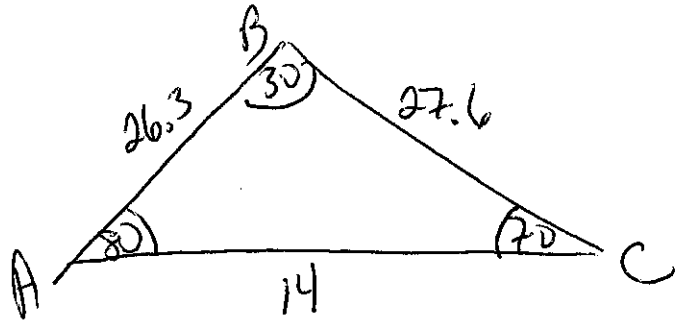
$\boxed{\measuredangle C = 132.9^\circ}$

$\measuredangle B = 180 - (13.8 + 132.9)$

$\boxed{\measuredangle B = 33.3^\circ}$

Unit 9 Assignment #22 Review #3

(9)



$\frac{\sin 30}{14} = \frac{\sin 80}{a}$

$a = 27.6$

$\angle C = 180 - (80+30)$

$= 70°$

$\frac{\sin 70}{c} = \frac{\sin 80}{27.6}$

$c = 26.3$

I can solve Basic TRIG Equations

(10) $\cos\theta = \frac{\sqrt{2}}{2}$

$\theta = 45°$ or 315

(11) $\sin\theta = \frac{\sqrt{3}}{2}$

$\theta = 60°$ or $120°$

(12) $\tan\theta = -1$

$\theta = 135°$ or 315

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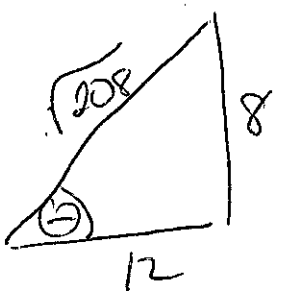
(14) $\cot\theta = \frac{12}{8}$ so $\tan\theta = \frac{8}{12}$



$\sin\theta = \frac{8}{\sqrt{208}}$ cscθ $\frac{\sqrt{208}}{8}$

$\cos\theta = \frac{12}{\sqrt{208}}$ secθ $\frac{\sqrt{208}}{12}$

$\tan\theta = \frac{8}{12}$ cotθ $\frac{12}{8}$