INTERMEDIATE DIVISION

Category 1: Right Triangles – includes Trig.

1. (2 pts)   On a graph what is the distance between A(-3,-6) and B(3,2)?

1. _____

2. (3 pts)   What is the area of an equilateral triangle whose sides measure 10 inches?

2. _____in²

3. (5 pts) $QUAD$ is a quadrilateral with QU = 12 inches, UA = 16 inches, angle $\underline{U}$ is a right angle, angle QAD is a right angle and angle D is 40°. What is the measure of QD to the nearest tenth of an inch?
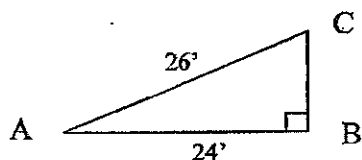
3. _____in

INTERMEDIATE DIVISION

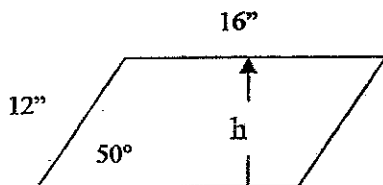### Category 1: Right Triangles – includes Trig.

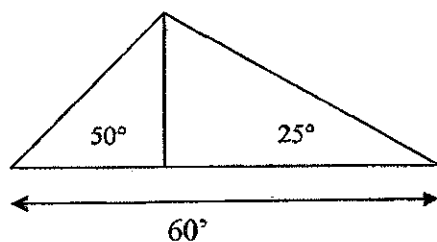1. (2 pts)   In right triangle *ABC*, find the length of side *BC*.

1. _____ft

2. (3 pts)   Find the height of the parallelogram. Round your answer to 2 decimal places.

2. _____in

3. (5 pts)   Find the height of the vertical pole. Round your answer to 4 decimal places.
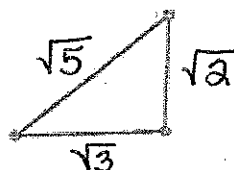
3. _____ft

Name _____   School _____

Intermediate Division

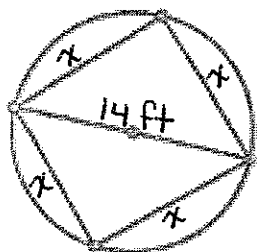Category 1   Right Triangles and Pythagorean Theorem

1. (2pts) Given the figure,
   is this a right triangle?
   Circle your answer and also
   support your answer with an
   explanation.

ANS _____ YES or NO _____

Why? _____
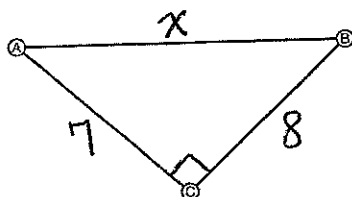
_____

2. (3pts) Find x in this circular figure. Round your answer to the nearest tenths.

ANS _____ ft.

3. (5pts) Find the length of x and the angle B in this figure. Answers should be to the nearest tenths.
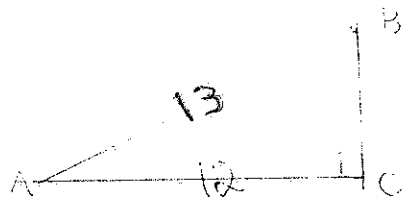

ANS _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N
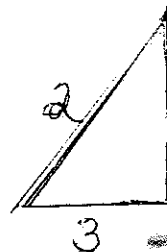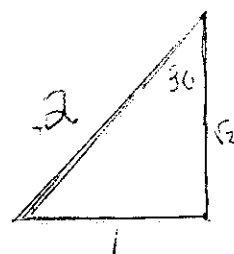
Category 1. Right Triangles

1. (2 Pts.)

B

13

A _____ C

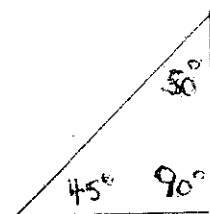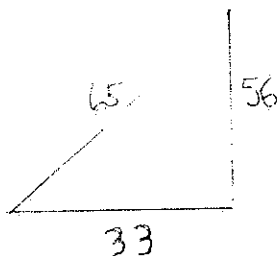Find the measure of ∠BAC. ANS. _____

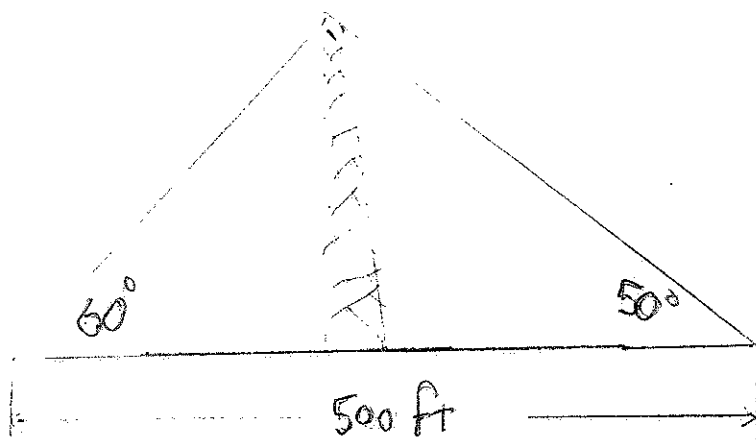Find the length of $\overline{BC}$.   ANS. _____

GIVE ANSWERS TO NEAREST HUNDREDTHS

2. (3 Pts.) Circle the triangles that are right triangles. (Not drawn to scale.)

$2\sqrt{2}$ $\sqrt{81}$ 65   56

1   33

50°

45°   90°

2   36   12

1

2

3
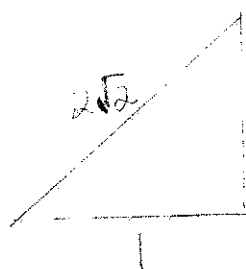
3. (5 Pts.) Find the height of this tower, to nearest feet.

60°   50°

├──────── 500 ft ────────┤

ANS. _____ ft

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangles

1. (2 Pts.) Solve this triangle for x.

ANS. _____

2. (3 Pts.) Surveying engineers want to measure the distance between two points A and B on rough land. They want to find the actual horizontal distance between A and B. If the earth is 0.75 meters higher midway between the two stakes and if the measuring tape reads 27.0 m, what is the actual distance between A and B?

ANS. _____

3. (5 Pts.) A person travels 8 miles due north, 3 miles due west, 7 miles due north, 11 miles due east. How far is that person from the starting point? Give direction and distance.
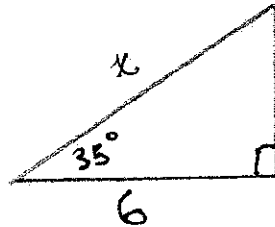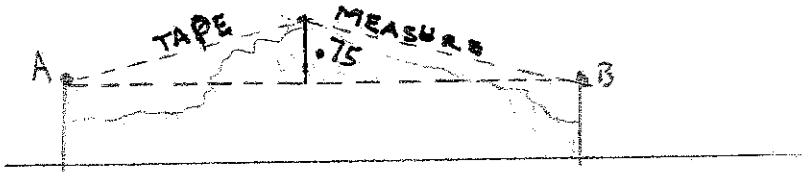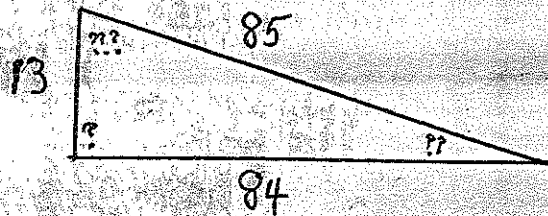
ANS. _____

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangles (including Trig and Pythagorean Theorem)
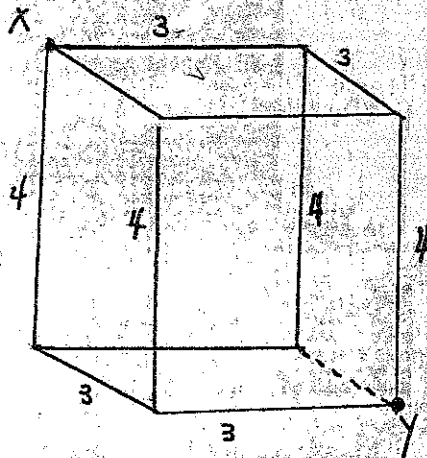
BE SURE TO LABEL ANSWERS. IF NO UNITS ARE GIVEN WRITE UNITS.
(i.e. sq. units, Cubic units)
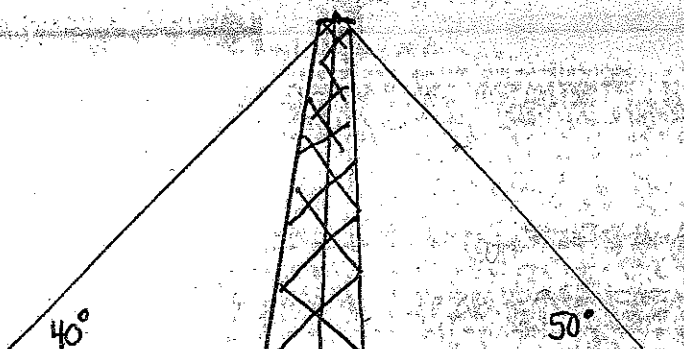
1. (2 Pts.) Find the area of this triangle.

ANS. _____

2. (3 Pts.) Find the length of the diagonal XY in this rectangular solid.

ANS. _____

3. (5 Pts.) Find the height of the tower.

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trigonometry

ROUND ANSWERS TO 3-PLACE DECIMALS, IF NEEDED.

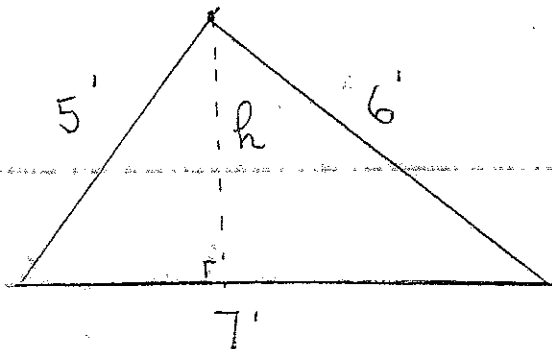1. (2 Pts.)

Find the length of BC.

5 inch, 60°, B, C, A
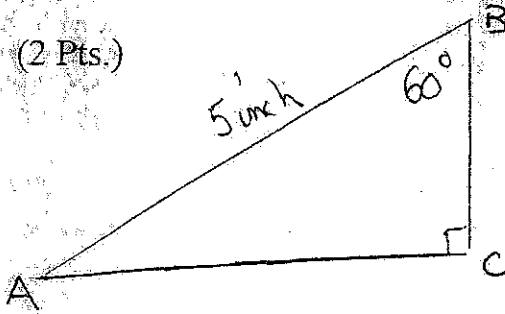
ANS. _____ inch

2. (3 Pts.)
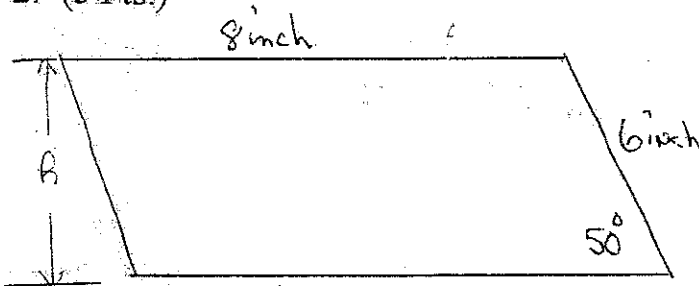
Find the height (h) of this parallelogram.

8 inch, h, 6 inch, 50°

ANS. _____ inch

3. (5 Pts.)

Find h.

5', h, 6', 7'

ANS. _____

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trigonometry

EXPRESS ALL ANSWERS CORRECT TO HUNDREDTHS WHEN NEEDED

1. (2 Pts.) Find the measure of $\angle A$.

A
3
5
?
C
4
B

$m\angle A = 53.13°$

ANS. _____

2. (3 Pts.) Find the measure of AC.

C
90°
31°
A
7
B

$\tan 31° = \dfrac{x}{7}$

ANS. AC 4.21 units

3. (5 Pts.) Find x in this triangle.
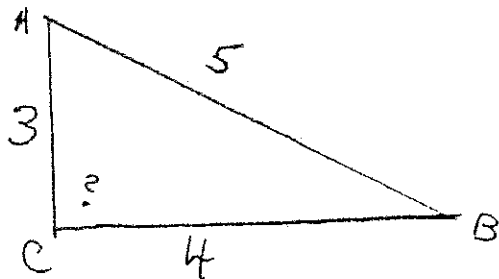
4
x
60°   60°
2

$x = 2\sqrt{3}$ ~ 3.46 units

ANS. _____

2

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N
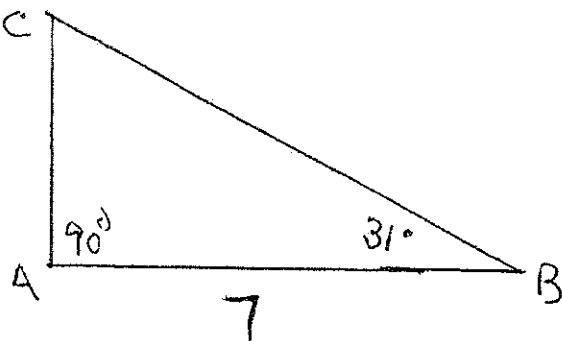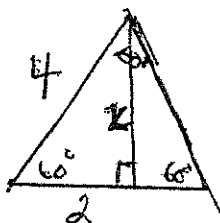
Category 1. Right Triangle Trigonometry

1. (2 Pts.) What are the angles of a 6, 8, 10 triangle? (Give the measure of all three.)

ANS. _____

2. (3 Pts.)   Find the height of this unusual tower.
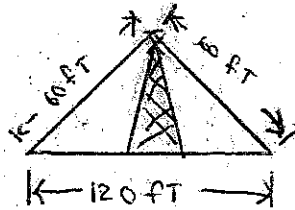
ANS. _____

3. (5 Pts.) As a train is traveling on a certain track, the engineer observes a column of

smoke at a 40° angle to his right. After traveling 10 minutes at 60 mph he

observes the same smoke at an angle of 55° behind him and also to his

right. How far was the track from the smoke stack?

ANS. _____

Name _____ No. _____ School _____

Category 1. Right Triangle Trig

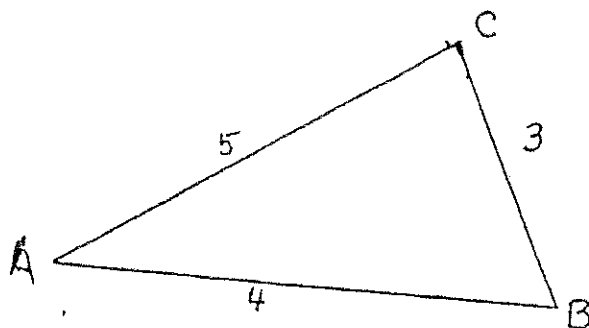1. (3 Pts.) Find the measure of the angles, (correct to the nearest hundredth of a degree), of this triangle. (Figure not drawn to scale.)

Ans. m∠A = _____ °
　　　　m∠B = _____ °
　　　　m∠C = _____ °

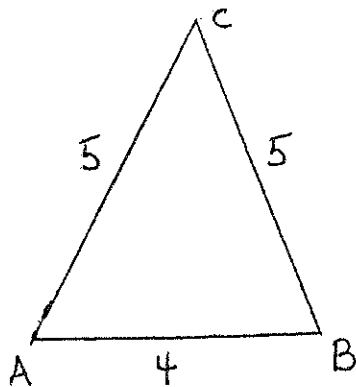2. (3 Pts.) Find the measure of the angles (correct to the nearest hundredth of a degree), of this triangle. (Figure not drawn to scale.)

ANS. m∠A = _____ °
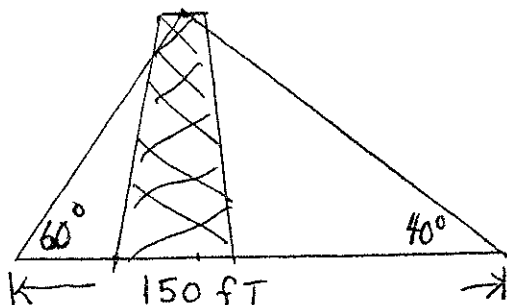　　　　m∠B = _____ °
　　　　m∠C = _____ °

3. (5 Pts.) Find the height of this tower. (Figure not drawn to scale.)

ANS. _____

Name _____ No. ____ School _____

Category 1. Right Triangle Trig

1. (2 Pts.) Solve each of these triangles for x, y, and z. Leave answers in radical form or correct to the nearest thousandth.

    a)
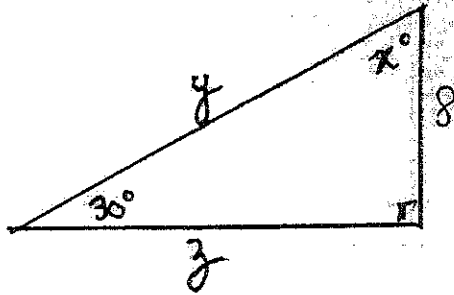
    x = _____
    y = _____
    z = _____

    b)

    x = _____
    y = _____
    z = _____

2. (3 Pts.) What are the measures of the angles of a 3-4-5 triangle?

    ANS. _____

3. (5 Pts.) Find the height of the tower.

    ANS. _____
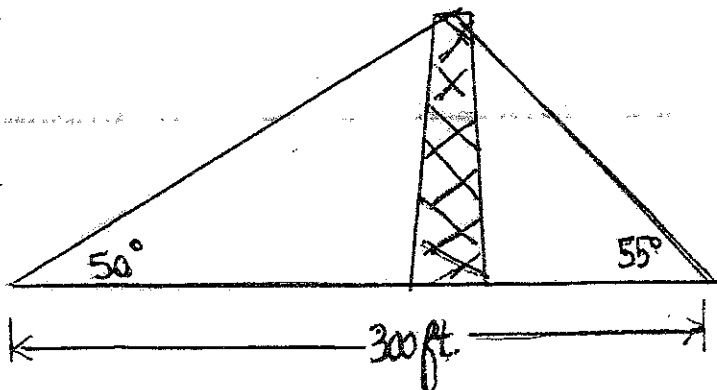
I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trig

1 (2 Pts.) Find two things wrong with this figure. (not drawn to scale)
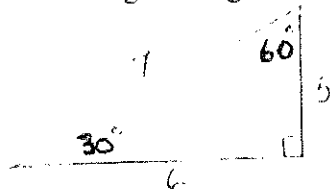
ANS 1) _____ _____

2) _____ _____

2 (3 Pts.) From a point 220 feet from the base of the Empire State Building and in the same horizontal plane, the angle of elevation of the top of the building is 80.0°. Find the height of the building.
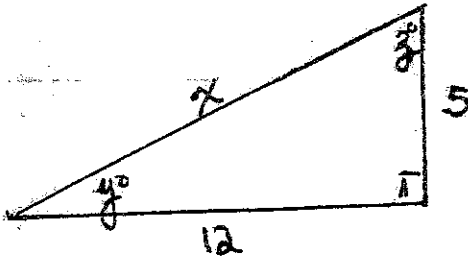
ANS. _____

3 (5 Pts.) Find the height of the taller column.

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trig

1. (2 Pts.) To the nearest hundredth of a foot, find the height of the flagpole.
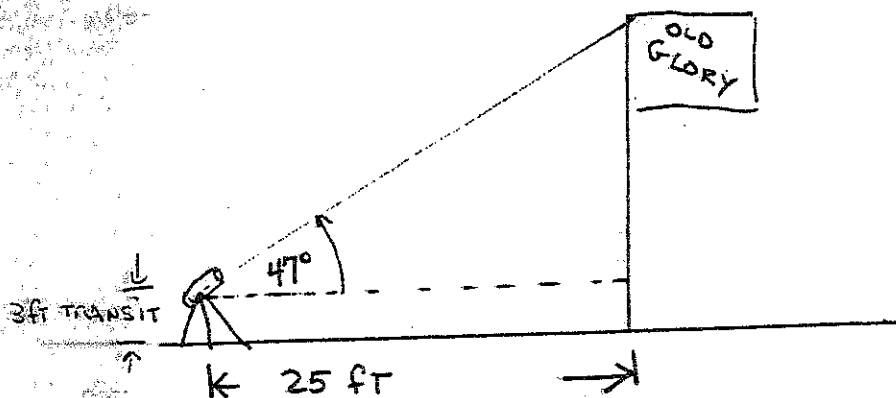
ANS. _____

2. (3 Pts.) EF is a fence 5 ft. high at a distance of 3 ft. from the wall OD of a house (see figure). Find the length of a ladder AB inclined at 72° to the horizontal just grazing the fence.
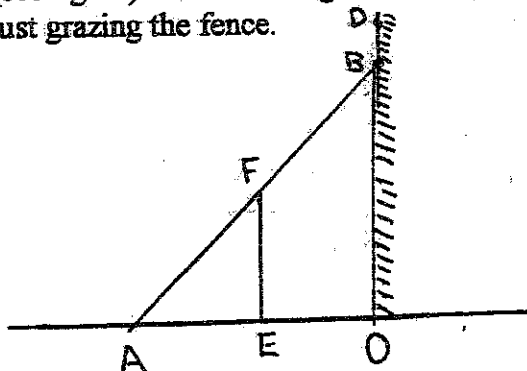
ANS. _____

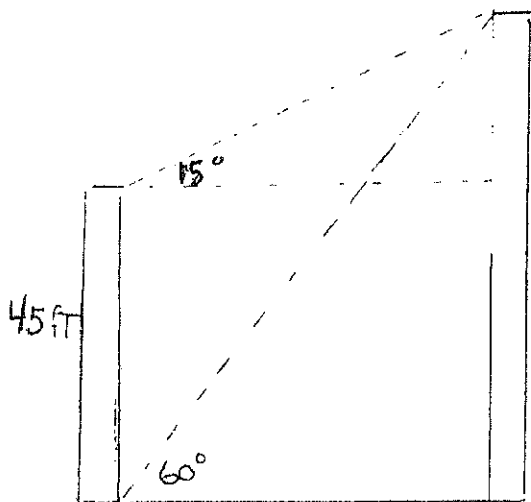2. (5 Pts.) The diagonals of a rectangle intersect at an angle of 33° 48' and the length of one side is 5 inches. What is the length of a diagonal? (If there are two possible answers, give both).

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E   D-I-V-I-S-I-O-N

Category 1.   Right Triangle Trig

1.   (3 Pts.)   Solve for x (correct to two decimal places).
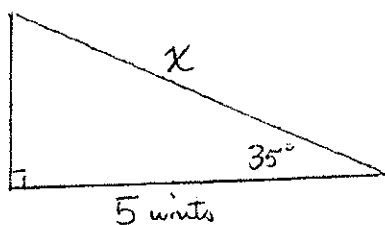
ANS. x = _____

2.   (3 Pts.)   Find the height of the tower (correct to two decimal places).
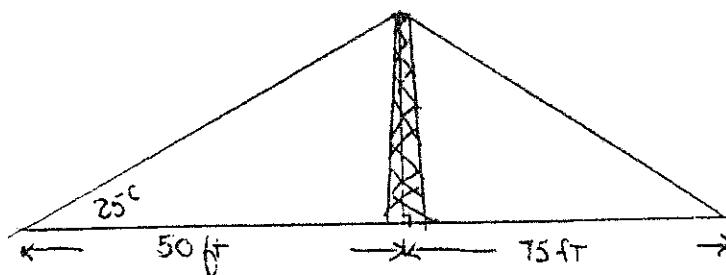
ANS. _____

3.   (5 Pts.)   Find the height of the tower (correct to two decimal places).

ANS. _____
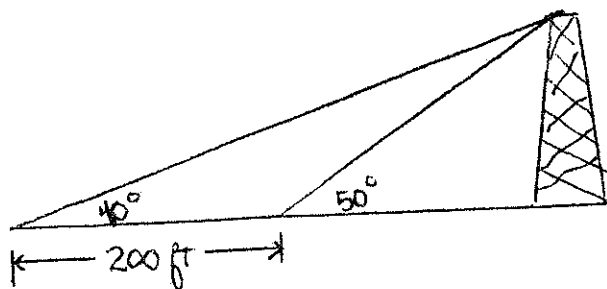
I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1.   Right Triangle Trig

1. (2 Pts.) Find x and y and θ for this triangle (correct to the nearest hundredth).
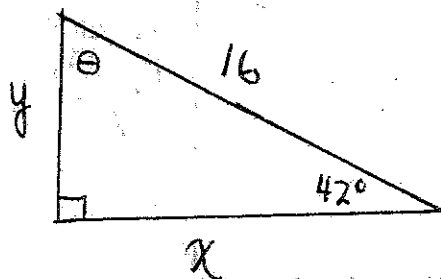
$$x =$$
$$y =$$
ANS. $\theta =$ _____

2. (3 Pts.) Solve each for θ where $0° < \theta < 90°$

a) Sin θ = .1234   ANS. _____

b) θ = Sin^{-1} .4321   ANS. _____

c) θ = arc Cos .5   ANS. _____

D) Cos θ = 1.2345   ANS. _____

3. (5 Pts.) Find the height of the tower to the nearest tenth of a foot.

ANS. _____
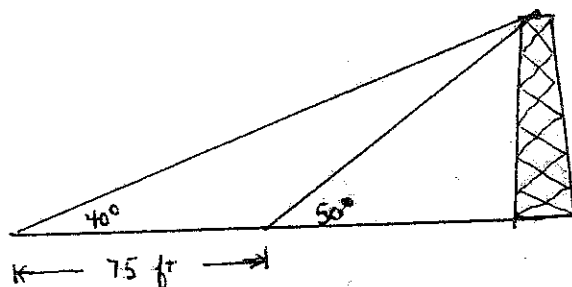
I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category I. Right Triangle Trigonometry

Calculators may be used in this category.
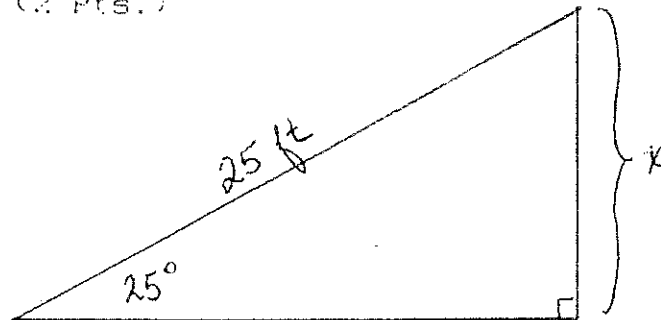
1.   (2 Pts.)

What is the
length of x?

25 ft

25°

x

ANS. _____
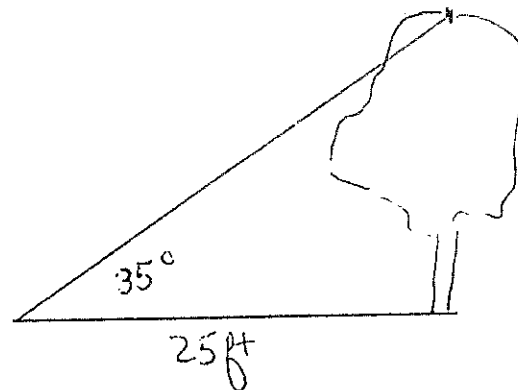
2.   (3 Pts.)

What is the
height of the
tree?
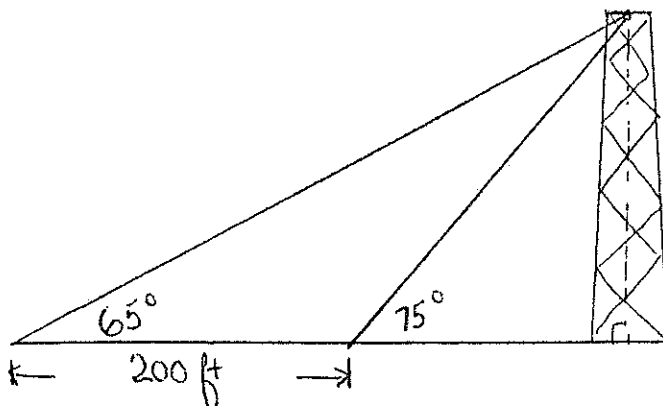
35°

25 ft

ANS. _____

3.   (5 Pts.)

What is the
height of the
tower?

65°   75°

200 ft

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trig

1. (2 Pts.)

$m\angle B = m\angle C = 40°$

$\overline{AM} \perp \overline{BC}$

$\overline{ME} \perp \overline{AB}$ FIND EM

$AC = 5$ units

ANS. _____
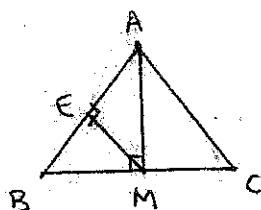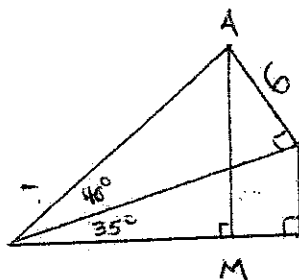
2. (3 Pts.)

Find the length of AM.

ANS. _____

3. (5 Pts.)
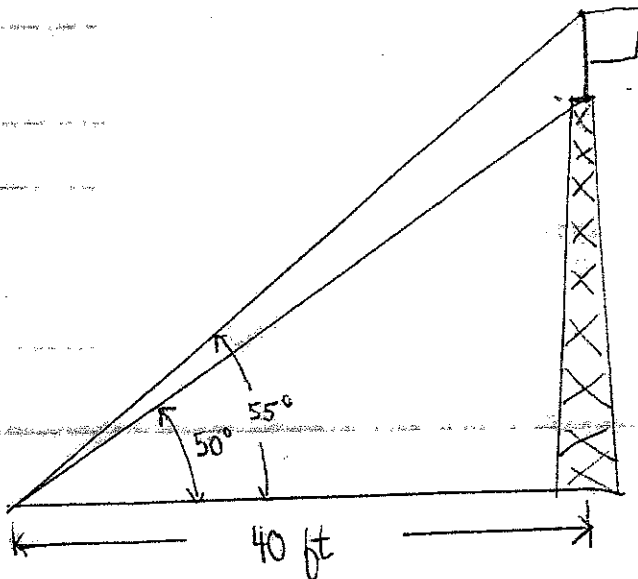
Find the height of the flag pole.

40 ft

ANS. _____ ft

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trig

Calculators may be used in this category

1. (2 Pts.)

Find answers correct
to 2 decimal places.
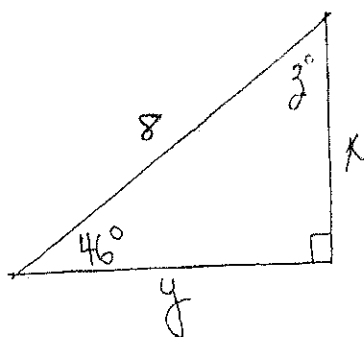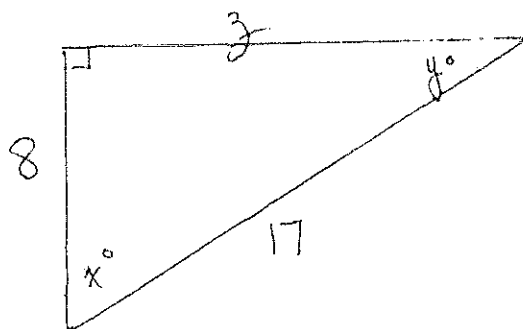
$z°$

8

x

$46°$

y

$x =$ _____

$y =$ _____

$z° =$ _____

2. (3 Pts.)

3

$y°$

8

$x°$

17

$x° =$ _____

$y° =$ _____

$z =$ _____

3. (5 Pts.) Secant $\ominus$ = 1.8926

$$\ominus = ?$$

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 1. Right Triangle Trig
(Calculators may be used in this catgegory.)

1. (2 Pts.) The Golden Rectangle named by ancient Greeks says that a rectangle with sides $\sqrt{5} + 1$ by 2 is the most pleasing to the eye. To further discuss this topic, what is the angle between the diagonal and the longer side?

ANS. _____

2. (3 Pts.) Find the area of this triangle.
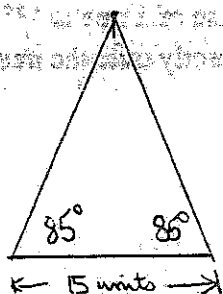
ANS. _____

3. (5 Pts.) Given a regular hexagon and a square as shown below, find the length of AB when the square has a side of 4 units.

ANS. _____
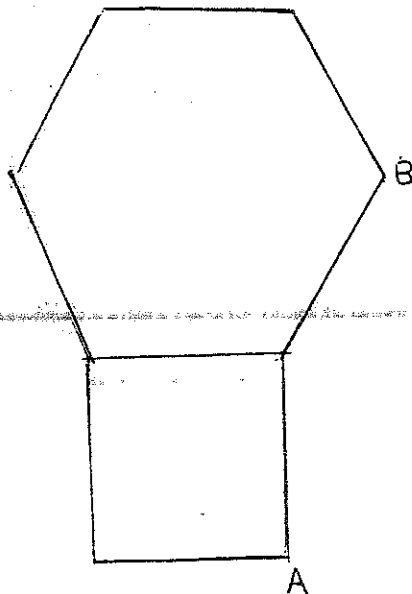
Right Triangle Trig

2 points Use the definitions of the three trigonometric ratios to complete each statement.

sin A = _____

cos A = _____

tan A = _____
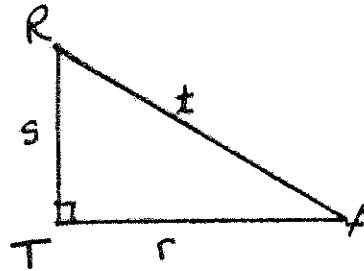
3 points An airplane is flying 10,500 feet above the level ground.
The angle of depression from the plane to the base of a tree is 13° 50'.
How far horizontally must the plane fly to be directly over the tree?

_____

5 points Find the height of the taller column.

_____
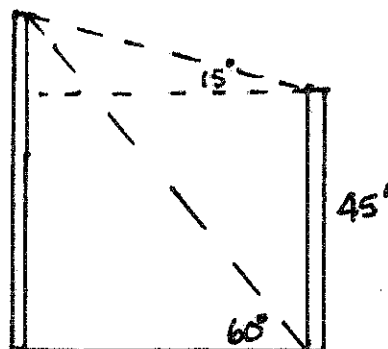
Trigonometry

2 points

a. Angles A and B are two acute angles of a right triangle. What is the measure of angle A if the sine of A equals the sine of B? _____

b. What is the measure of angle A if the tangent of A is 1? _____

c. As an angle measure gets closer and closer to 0°, the values of the sine ratio gets closer and closer to what value? _____

d. As an angle measure gets closer and closer to 0°, the values of the cosine ratio gets closer and closer to what value? _____

3 points

Billy's pet bat *Batty* is flying at the end of a 50-foot leash. Using an angle measuring device, Billy spots *Batty* at an angle of 55° up from the horizontal. To the nearest hundredth, how high is *Batty* flying if the leash is taut and anchored to the ground?

_____

5 points

A farmer wishes to fence and plant a trianglular plot of ground. One side of the plot makes a 45° angle with an east-west line, and is 500 feet long. A second side runs parallel to the east-west line, and the third side makes a 30° angle with the east-west line. Find the perimeter of the plot to the nearest tenth of a foot.
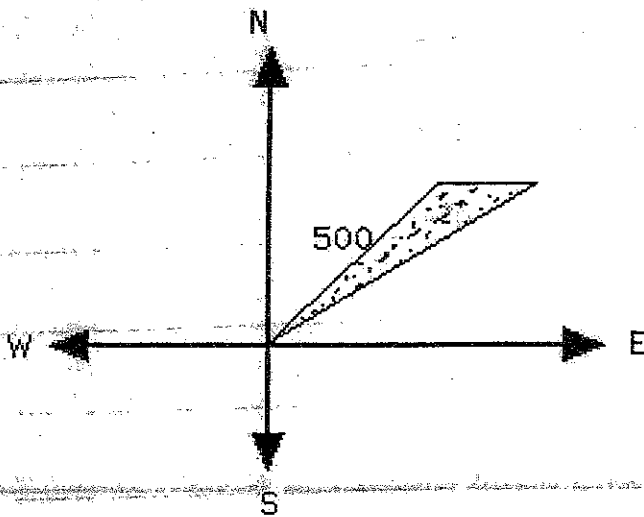
_____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

CALCULATORS MAY NOT BE USED IN THIS CATEGORY

1 (2 Pts.)
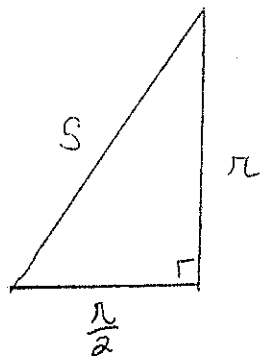
State s in terms of r only.
Simplest form only

S

r

$\frac{r}{2}$

ANS. _____

2. (3 Pts.) Use the Pythagorean Theorem to find the distance between the points (2,1) and (6,3).

ANS. _____

3. (5 Pts.)
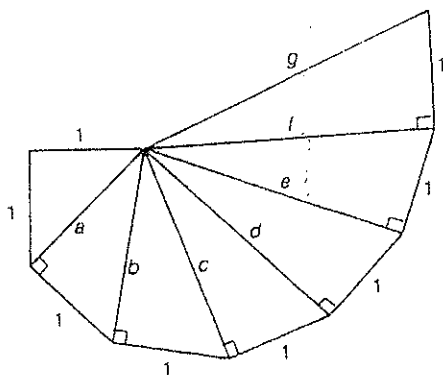
Find the length of:

a = _____

b = _____

c = _____

d = _____

e = _____

f = _____

g = _____

Name _____ No. _____ School _____

Category 2. Pythagorean Theorem

CALCULATORS MAY NOT BE USED IN THIS CATEGORY

1. (2 Pts.) Find x in each of these triangles.

$$\begin{array}{ll}24 & 576 \\ 24 & 4900 \\ \hline 96 & 5476\end{array}$$
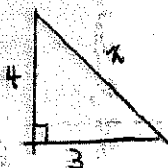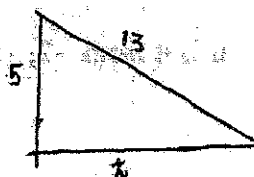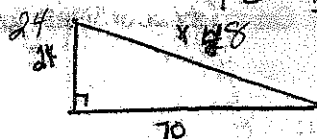
a) x = __5__   b) x = __12__   c) x = _____

2. (3 Pts.) Given the triangle   show that $\sin^2\theta + \cos^2\theta = 1$

$$\sin\theta = \frac{a}{c} \qquad \text{and } a^2 + b^2 = \boxed{c^2}$$

$$\cos\theta = \frac{b}{c}$$

$$\left(\frac{a}{c}\right)^2 + \left(\frac{b}{c^2}\right)^2 = \qquad \frac{a^2 + b^2}{c^2} = \frac{c^2}{c^2} = 1$$

3. (5 Pts.) Given $\triangle ABC$ with $m\angle A = 90^\circ$, $Cx = 4$, $Bx = 5$, find Ax.
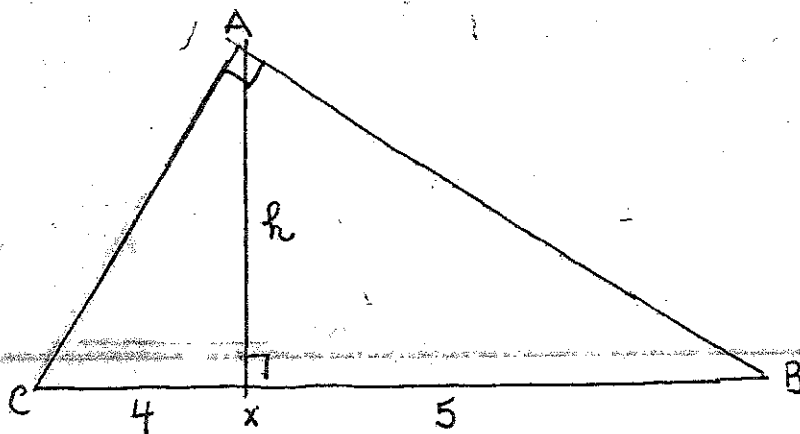
ANS. __$\sqrt{20} = 2\sqrt{5}$__

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

CALCULATORS ARE NOT ALLOWED IN THIS CATEGORY

1. (2 Pts.) On an xy coordinate graph, how far is it from (-2, -4) to (2, -1)?

ANS. _____

2. (3 Pts.)
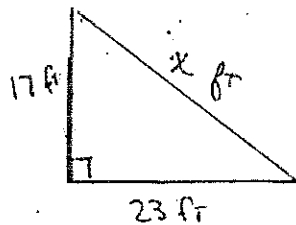
Find correct to the nearest whole number, the length of the hypotenuse, of this right triangle.

ANS. _____

3. (5 Pts.) Find correct to the nearest tenth, the length of YZ.

ANS. _____

14

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1. (2 Pts.) TRUE - FALSE

_____ a) The Pythagorean Theorem says a triangle with a 90° angle is a right angle.

_____ b) The Pythagorean Theorem says $A^2 + B^2 = C^2$

_____ c) The Pythagorean Theorem says that a triangle with sides 33, 56, 65 is a right triangle.

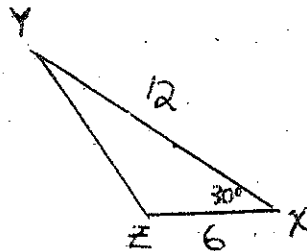_____ d) The Pythagorean Theorem says the side opposite the 30° angle in a 30°-60°-90° right triangle is 1/2 the hypotenuse.

2. (3 Pts.) How far can you see? The Sears Tower in Chicago is 1454 ft. above ground level. It has an observation tower at the highest level. How far can a person see (with the aid of a telescope) from this tower? Use the radius of the earth as 3960 miles and that 5280 feet = 1 mile.

ANS. _____

3. (5 Pts.) Find the length of the sides of the triangle having vertices at A(2,-1), B(-2,-4), C(5,3).

ANS. _____
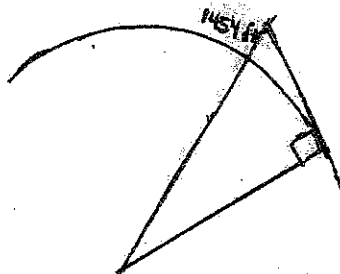
I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1. (2 Pts.) The Pythagorean Theorem states that if $A^2 + B^2 = C^2$ then $\angle C$ is a right

angle and conversely. What does the "conversely" mean? Explain.

2. (3 Pts.) In $\triangle$ ABC, m$\angle$B = 90°, AB = 8 in., AC = 17 in., D is a point on $\overline{BC}$ such

that BD = 5 in. Find the area of $\triangle$ ADC.

ANS. _____

3. (5 Pts.) $\overline{BA}$, $\overline{CD}$ are drawn perpendicular to $\overline{BC}$ on opposite sides of $\overline{BC}$; AB = 4in.;

BC = 5 in.; CD = 6 in.; CB is produced to a point P such that PD = 2PA.

Find the length of PB.

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1. (2 Pts.) In the figure, AD = 10 in., AB = 8 in., BC = 4 in. Find CD.
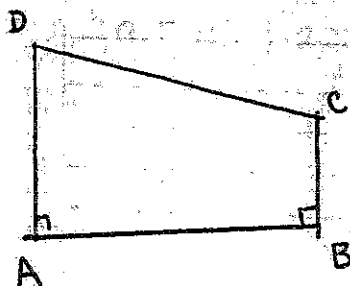
ANS. _____

2. (3 Pts.) PQRS is a quadrilateral in which ∠PQR and ∠PRS are right triangles. If PQ = 12 ft., QR = 9 ft., RS = 8 ft., find the length of PS and the area of PQRS. (Be sure to label answers).

ANS. PS= _____

A quad PQRS = _____

3. (5 Pts.) Find the lengths of the sides of this triangle.

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1 (2 Pts.) Complete the following chart. (This is part of your answer.)
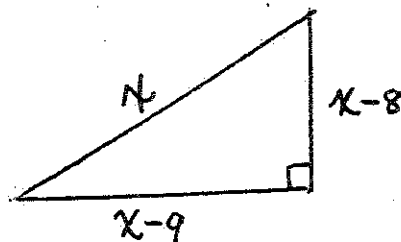
m	n	$m^2 - n^2$	$2mn$	$m^2 + n^2$
2	1	3	4	5
4	1			
3	2			
4	3			

Are the numbers that you have generated Pythagorean triples?

ANS. <u>YES or NO</u>
(Circle correct answer.)

2 (3 Pts.) Given

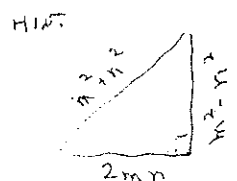| m	n	$m^2 - n^2$	$2mn$	$m^2 + n^2$
25	2	621	100	629
34	7	1107	476	1205

Are 100; 621; 629 Pythagorean triples?

ANS. <u>YES or NO</u>
(Circle correct answer.)

Are 476; 1107; 1205 Pythagorean triples?

ANS. <u>YES or NO</u>
(Circle correct answer.)

3. (5 Pts.) Show that $m^2 - n^2$, $2mn$, $m^2 + n^2$ generate Pythagorean triples.

HINT:

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1. (2 Pts.) Find the missing number in the following sets

of Primitive Pythagorean Triples.

(Express answer in simplest radical form or to
two decimal places.)

A. 119, 120, _____

B. 120, _____, 241

C. _____, 3599, 3601

2. (3 Pts.) ABCD is a quadrilateral in which $\angle B = \angle D = 90°$

If AB = 6 in., BC = 8 in., CD = 5 in., what

is the length of AD? (Give answer in simplest
radical form or correct to hundredths.)

ANS. AD = _____

3. (5 Pts.) Two roads AOB, COD run east and north; a man

"P" passes thru O at 2 pm walking east at 3

mph; a man "Q" passes thru O at 2:30 pm

walking north at 4 mph. When are "P" and "Q"

3 miles apart?

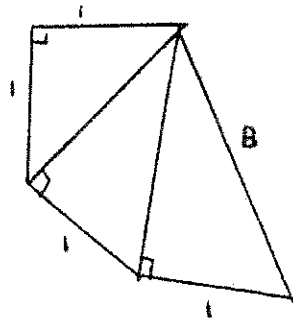(Express answer correct to the nearest minute)

ANS. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1. (2 Pts.) From the figure, determine B.

ANS. _____

2. (3 Pts.) Compute the area of a right triangle in which the lengths of the hypotenuse and one leg are 2045 and 693 (a numerologists' delight).

ANS. _____

3. (5 Pts.) A railroad track 1 mile long expands on a very hot day. The track is firmly anchored at both ends and so the track bends in the middle as shown. The track expands 1 foot for the mile length. 1 mile = 5280 ft.
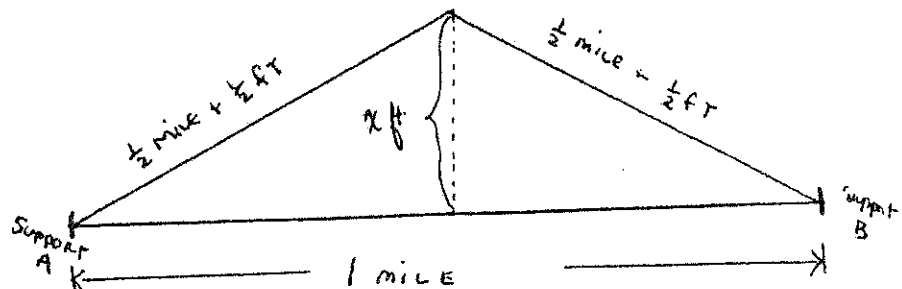
Find how high the track would rise.
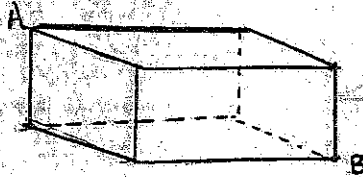(i.e. Find the distance x.

ANS. _____

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Pythagorean Theorem

1. (2 Pts.)

Given a rectangular solid with sides 3, 4, and 5 inches, find the length of a diagonal of the solid (i. e. $\overline{AB}$), correct to the nearest whole number.

ANS. _____

2. (3 Pts.) A pyramid of height 7.5 inches stands on a square base of side 4 inches; all the slant edges are equal. Find their lengths to the nearest 0.1 of an inch.

ANS. _____

3. (5 Pts.) Given the sides of a triangle as $m^2 - n^2$, $2mn$, and $m^2 + n^2$. Use this information to find 5 sets of Primative Pythagorean Triples. (i.e. 3 whole numbers that are sides of a right triangle and are not multiples of any other triples.) Of course, one of your 5 sets of Primative Pythagorean Triples should be 5, 12, 13.
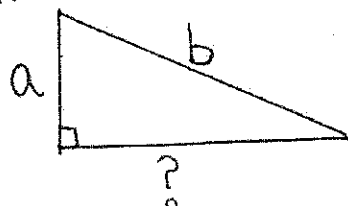
ANS. _____

_____

_____

_____

_____

I-N-T-E-R-M-E-D-I-A-T-E   D-I-V-I-S-I-O-N

Category 2.   Pythagorean Theorem

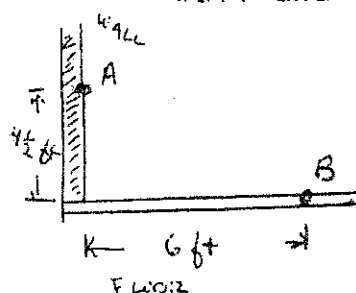1.   (2 Pts.)   GIVEN: Find ? in terms of
   a and b.

ANS. _____

2.   (3 Pts.)   In remodeling a house, a carpenter checks the
squareness of a wall and a floor. A 4 1/2 foot length is
marked off on the wall, (point A), as shown in the figure
and a 6 foot length is marked off on the floor, (point B).
The measurement from point A to point B is 7' 9".   Are the
wall and the floor square? (SHOW YOUR CALCULATIONS.)

CIRCLE   YES   OR   NO

NOW EXPLAIN

3.   (5 Pts.)   Determine the distance X correct to the
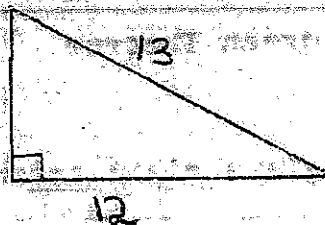nearest tenth of a meter.
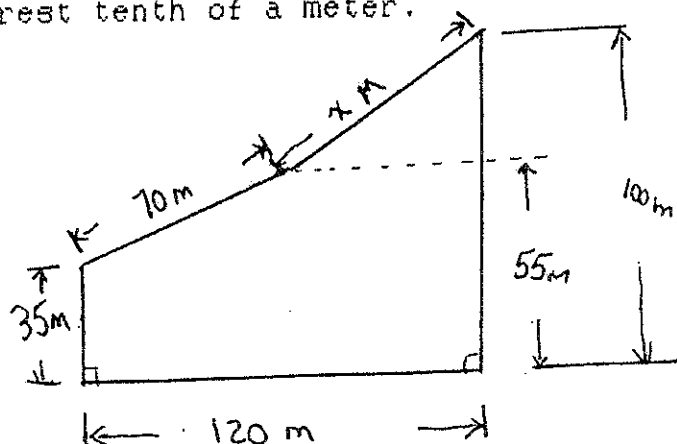
Name _____ No. _____ School _____
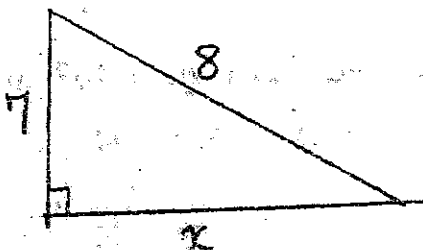
INTERMEDIATE DIVISION

Category 3. Pythagorean Theorem.
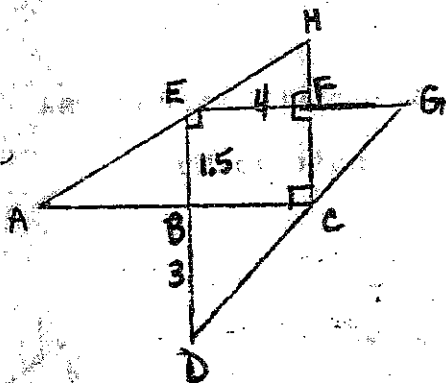
1. (2 Pts.) Find the area of this triangle.

ANS. _____

2. (3 Pts.) Find the length of x.

ANS. _____

3. (5 Pts.) Find AH.

Given

$\overline{DE} \perp \overline{EG}$

$\overline{HF} \perp \overline{EG}$

$\overline{HC} \perp \overline{AC}$

EF = 4

BD = 3

DE = 4.5

$m\angle A = m\angle G$

FIND AH

ANS. _____

INTERMEDIATE DIVISION
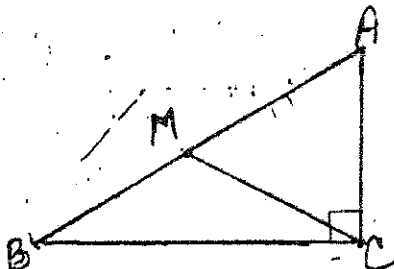
Category 3. Pythagorean Theorem

1. (2 Pts.) Is the following triangle a right triangle? Why or why not? Explain your answer.

ANS. _____

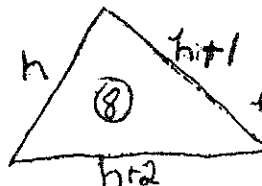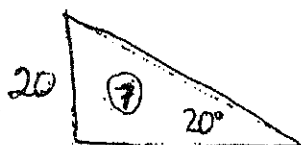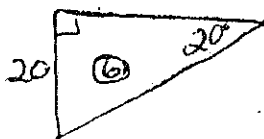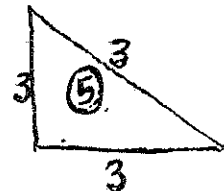2. (3 Pts.) Given right triangle ABC with $\angle C = 90°$ and M is the midpoint of AB. AC = 20, BC = 21. Find MC.
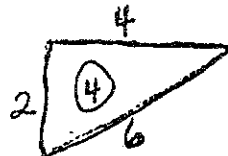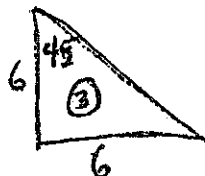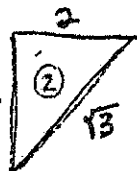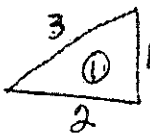

ANS. _/_____

3. (5 Pts.) Tell which of the following are right triangles. Sides and angles are drawn to confuse you. Don't go by the figure, go by the numbers.

ANS. _____

INTERMEDIATE DIVISION

Category 3. Pythagorean Theorem

1. (2 Pts.)

ABCD is a quadrilateral.

AB = BC = 10

CD = 5

$\angle ABD = 90°$

$\angle BCD = 90°$

Find AD.

ANS _____

2. (3 Pts.) Tell which are **not** Pythagorean Triples.
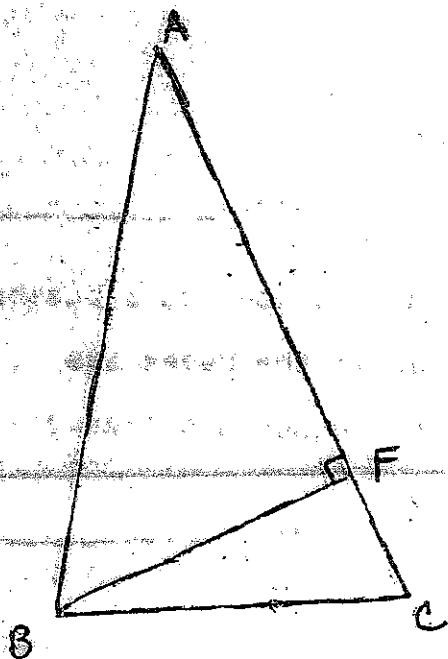
a) 3, 4, 5

b) 5, 12, 13

c) 8, 15, 17

d) 10, 15, 20

d) 20, 21, 29

r) 33, 56, 65

ANS _____
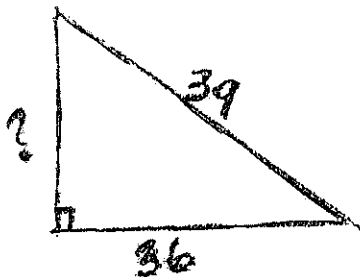
3. (5 Pts.)

AB = AC = 20

BC = 10

BF is an altitude.

Find FC.

ANS FC = _____

INTERMEDIATE DIVISION

Category 3. Pythagorean Theorem

1. (2 Pts.) Find the missing side of this triangle.

ANS. _____

2. (3 Pts.) AD is an altitude of $\triangle$ ABC. If $m\angle C = 45°$ then

a) $AB^2 = BD^2 + DC^2$

b) $AB^2 = BC^2 + AC^2$

c) $AB^2 = BD^2 + AD^2$

d) $AC^2 = AD^2 + DC^2$

e) $AC^2 = AB^2 + BC^2$
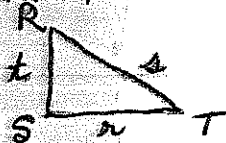
Tell which of the above are correct.

ANS. _____

3. (5 Pts.) Calculate the straight-line distance on a baseball diamond from first base to third base if the bases are 90 ft. apart. (Round your answer to the nearest foot.)
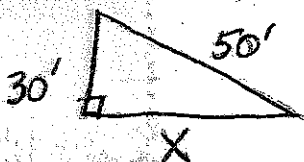
ANS. _____

CAT 3 - PYTHAGOREAN THM

① GIVEN THE TRIANGLE RST WITH m∠S=90°, STATE THE
PYTHAGOREAN THEOREM IN TERMS OF THE SIDES
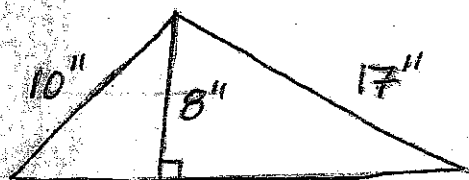
ans. _____

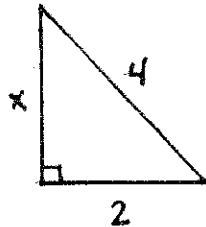② FIND X IN THIS TRIANGLE

ans _____

③ FIND THE AREA OF THIS TRIANGLE

ans _____

④ A helicopter ascends vertically to an altitude of 1000 ft, flies North for 2000 ft, turns and flies due East for 3000 ft. How far is the helicopter from its launching site? (Give answer correct to the nearest 100 ft.)

Category 2
Pythagorean Theorem

Name:

2 points Find the exact length of *x*.

_____

3 points A man travels 7 *km* due north, 3 *km*, due east, 8 *km* due north, 2 *km* due east and 1 *km* due south. How far is he from his starting point?

_____

5 points A giant California redwood tree 36 meters tall cracked in a violent earthquake and fell as if hinged. The tip of the once beautiful tree hit the ground 24 meters from the base. Researchers want to investigate the crack. How many meters up from the base of the tree do the researchers have to climb?
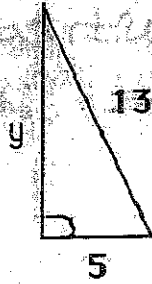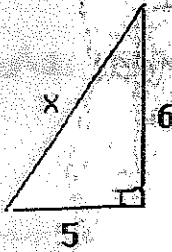
_____
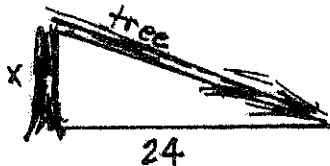
Pythagorean Theorem

2 points

Find the missing side length of each triangle. Give the exact length.
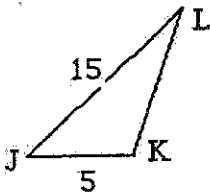
$x =$ _____

$y =$ _____

3 points

What is the longest stick that can be placed inside a rectangular box with inside dimensions of 24 inches, 30 inches, and 18 inches?

_____

5 points

In $\triangle JKL$, the length of the altitude from L is $5\sqrt{5}$.

Find the length of $\overline{KL}$ (to the nearest tenth).

_____

23

1. Find the length of a side of a square
   if a diagonal is   a) $6\sqrt{2}$ in.
                      b) 9 in.
                      c) a in.

2. Find the length of an altitude of
   an equilateral $\triangle$ whose side measures.
   5 ft.

3. The area of a rhombus is 49 cm^2 and the length
   of one diagonal is twice that of the other.
   Find the length of the shorter diagonal and
   a side length of the rhombus.

4.

   $2x-3$
   $\sqrt{x+25}$
   $x+2$
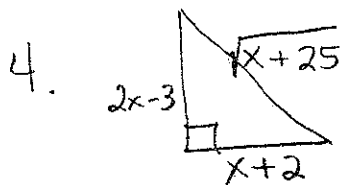
   Solve for X

Right Triangle Trig study guide

Know the following:

$$\csc\theta = \frac{1}{\sin\theta}$$

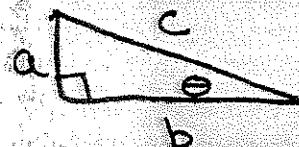$$\sin\theta = \frac{1}{\csc\theta}$$

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

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

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\cot\theta = \frac{\cos\theta}{\sin\theta}$$

$$\tan\theta = \frac{1}{\cot\theta}$$

$$\cot\theta = \frac{1}{\tan\theta}$$

Remember, these are reciprocals:

{sin,csc} {cos,sec} {tan,cot}
i.e. $\sin\theta * \csc\theta = 1$

You will probably need these:

$\cos\theta = \sin(90°-\theta)$ i.e. $\cos 32° = \sin 58°$
$\sin\theta = \cos(90°-\theta)$ i.e. $\sin 43° = \cos 47°$

Pythagorean Theorem

For any right triangle with legs
a,b and hypotenuse c,

$$\boxed{a^2 + b^2 = c^2}$$

SOHCAHTOA

$$\sin\theta = \frac{a}{c}$$
$$\cos\theta = \frac{b}{c}$$
$$\tan\theta = \frac{a}{b}$$

Identities

$$\sin^2\theta + \cos^2\theta = 1$$
$$\tan^2\theta + 1 = \sec^2\theta$$
$$\cot^2\theta + 1 = \csc^2\theta$$

$$0 \le \sin\theta \le 1$$
$$0 \le \cos\theta \le 1$$

$$-\infty \le \tan\theta \le +\infty$$

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