Name _____ **School** _____

INTERMEDIATE DIVISION
Category 2: Algebra I Word Problems

1. (2 pts.) Jane invested $25,000. Part of this amount was invested at a 2% interest rate and the other part of this amount was invested at a 5% interest rate. The total interest on her investment was $861.50. How much did she invest at 5%?

1. _____

2. (3 pts.) Mixture A is 60% water and 40% lemon juice. Mixture B is 90% water and 10% lemon juice. How many gallons of Mixture A should be combined with Mixture B to produce exactly 20 gallons of a solution that is 80% water and 20% lemon juice?

2. _____gallons

3. (5 pts.) Bob always paddles his canoe at the same speed. It took him 75 **minutes** to go 3 miles from his home to the picnic spot when the current was flowing with him. It took him 100 **minutes** to paddle back home when the current was flowing against him. How many miles per **hour** does he paddle with no current?

3. _____mph

Name_____ School_____

INTERMEDIATE DIVISION
Category 2: Algebra I Word Problems

1. (2pts) Trains 1 and 2 leave towns A and B respectively at the same time traveling towards each other. Train 1 travels 40 mph and train 2 travels 60 mph. They pass each other after $2\frac{1}{2}$ hours. How far apart are towns A and B?

1. _____ miles

2. (3 pts) A cake mix currently has 15 cups of dry ingredients: 10 cups of flour and 5 cups of sugar. The mixture should be 30% sugar. How much flour must be added?

2. _____ cups

3. (5pts) If four people working 30 days can paint 10 identical houses, how long will it take one person to paint one house?

3. _____ days

Name _____ School _____

Intermediate Division

Category 2 Algebra 1 Word Problems

1. (2pts) My dad worked in the saw mill. He made $100 a week. He was a good worker and got a 10% raise. (He was happy.) A year later work got very slow and he got a 10% decrease in pay. (He was very mad.) What was his new weekly earnings?

ANS _____

2. (3pts) Admission tickets to a movie theatre cost $7 for adults and $2.50 for children. If 76 tickets were sold and the total receipts were $424, how many of each type of tickets were sold?

ANS _____ adults

ANS _____ children

3. (5pts) One painter can pain a room in 12 hours and another can paint the same room in 10 hours. How long will it take to paint the room if they work together?

ANS _____ hours

Name _____ School _____

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

Category 2. Algebra I Word Problems

1. (2 Pts.) The volume of a sphere varies as R^3, Rbeing the radius. Compare the volumes of two spheres having radii in the ratio of 3 to 2.

ANS. $\frac{\text{Vol. 1}}{\text{Vol. 2}}$ = _____

2. (3 Pts.) There are 3 discs denoted by A, B, C. One disc is red, one is blue, and one is white. Deduce the color of A, B, C respectively from the fact that one, and only one, of the following statements is true: (1) A is red; (2) B is not red; (3) C is not blue,

ANS. A B C
( ) ( ) ( )

3. (5 Pts.) The area of a rectangle is 100 sq. ft. If the length were increased by 3 ft. and the width decreased by 2 ft., the area would be decreased by 5 sq. ft. Find the dimensions of the rectangle.

ANS. length = _____

width = _____

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. Algebra I Word Problems

1. (2 Pts.) Joe drove his car 396 miles on 15 gallons of gas. Gas cost $2.71 per gallon. How much did Joe pay for gas per mile driven?

ANS. _____

2. (3 Pts.) Joe wants to buy a stereo system which costs $228.50. He makes a down payment of $50 and will pay the remainder in 6 monthly payments. What will be the amount of each monthly payment?

ANS. _____

3. (5 Pts.) Joe is in a big shopping mall. It has an escalator that has 30 steps which go up at a rate of one step per second. Joe gets on and walks up at his own rate. At the top he realizes that he dropped his wallet on the lower floor and decides to walk back down the same escalator so he can keep the wallet in view. Joe walks down at the same speed he walked up. It takes him twice as long to get down as it took him to go up. How fast is Joe's walking speed? (steps per second) Discount factors such as turn-around time.

ANS. _____ STEPS PER SECOND

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. Algebra I Word Problems

1. (2 Pts.) The Obama's wish to install a ceramic-tile deck around their rectangular swimming pool. The pool measures 30 ft. by 36 ft. and the deck is to be 3 ft. in width. Calculate the area of the tiled deck.

ANS. _____

2. (3 Pts.) A box contains 44 coins, all dimes and quarters. If the value of the quarters is 50 cents more than the value of the dimes, find the number of each type of coin.

ANS. # of dimes _____

# of quarters _____

3. (5 Pts.) Find 3 consecutive even numbers such that three times the first is 20 more than twice the third.

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. Algebra I Word Problems

1. (2 Pts.) A store had a special sale on two models of radios. The sale prices were $49.50 for an AM/FM model and $34.95 for an AM model. The total income for the sale was $5,958 and 138 radios were sold. How many of each model were sold?

ANS. _____ (AM/FM radios)

ANS. _____ (AM radios)

2. (3 Pts.) Dan and Jan walked a total of 28 miles for the March of Dimes and earned $5.00. Dan walked for 15 cents a mile while Jan got 20 cents a mile. How many miles did Dan walk? How many miles did Jan walk?

ANS. _____ (Dan)

ANS. _____ (Jan)

3. (5 Pts.) A boy was offered a bonus if he sold 100 subscriptions to a magazine. Each day he sold three subscriptions more than he had sold on the previous day, and on the eighth day he reached a total of exactly 100 subscriptions. How many subscriptions did he sell each day?

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. Algebra I Word Problems

1. (2 Pts.) I get time and a half over 40 hours a week. I get $12.75/hr. I pay 26% income tax, $35/week for insurance, and give a buck for the office pool (not taken out of my check.) Last week I worked 45 hours. What was the amount of my check?

ANS. _____

2. (3 Pts.) I bicycled t hours at r mph and then ran p hours at q mph, going a total distance of D miles. In terms of t, r, p, and D, find my running rate.

ANS. $q =$ _____

3. (5 Pts.) The sum of a number and the reciprocal of the number is twice the number. What is the number? (Be sure to find any and all numbers that will satisfy the condition.)

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. Algebra I Word Problems

1. (2 Pts.) The ratio of defective parts to good parts produced during the 11 PM to 7 AM shift is 5 to 205. If 2,730 parts are produced during that shift, how many are defective?

ANS. _____

2. (3 Pts.) A solution consists of 2 parts water and 3 parts alcohol. How many ounces of water are there in 80 ounces of the solution?

ANS. _____

3. (5 Pts.) A boat that travels at the rate of 5 mph in still water, travels against a current flowing at the rate of 1 ½ mph. If the boat leaves its home port at 8:00 AM and arrives at its destination in 6 7/8 hours, what is the distance from home port to its destination?

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. Algebra I Word Problems

1. (2 Pts.) If a boy/girl walks for x hours at 3 1/2 mph, bicycles for (5 - x) hours at 9 1/2 mph, and the total distance traveled is d miles, express d in terms of x.

ANS. _____

2. (3 Pts.) A chemist wishes to obtain 100cc (cubic centimeters) of a 25% solution of a certain acid by mixing a 20% solution and a 50% solution of the acid. How many cc of the 20% solution should he use?

ANS. _____

3. (5 Pts.) Show that if a square and a rectangle have equal perimeters, the area of the square is greater than the area of the rectangle. (Hint: Let the side of the square be n inches and let the length of the rectangle be (n - a) inches).

ANS. _____

Name _____ No. _____ School _____

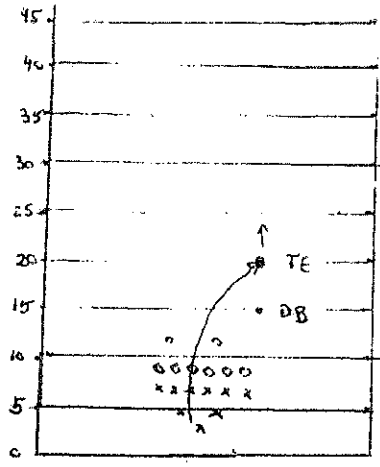
I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 2. Algebra I Word Problems

1. (2 Pts.) A worker who is paid time-and-a-half for hours worked in excess of 40 hours had gross weekly wages of $442 for 48 hours worked. What is the regular hourly rate?

ANS. _____

2. (3 Pts.)



A tight end can run the 100 yard dash in 12 seconds. A defensive back can do it in 10 seconds. The tight end catches a pass at his own 20 yard line with the defensive back at the 15 yard line. If no other players are nearby, at what yard line will the defensive back catch up to the tight end?

ANS. _____

3. (5 Pts.) The cooling system of a certain foreign-made car has a capacity of 15 liters. If the system IS filled with a mixture that is 40% antifreeze, how much of this mixture should be drained and replaced by pure antifreeze so that the system is filled with a solution that is 60% antifreeze?

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. Algebra I Word Problems

1. (2 Pts.) Determine the selling price for an electric toaster that costs $10.22 if the profit is 30% of the selling price.

ANS. _____

2. (3 Pts.) Gina has a collection of coins consisting of nickels, dimes, and quarters. She has twice as many dimes as quarters and 8 more nickels than dimes. If her total collection of coins is worth $5.90, how many of each kind of coin does she have?

ANS. _____

3. (5 Pts.) One boy can run 100 yards in 17 seconds and a second boy can run the same distance in 16 seconds. In a race between them, how long will it take the faster boy to gain a lead of 2 yards over the slower boy?

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. Algebra I Word Problems
(Calculators may be used in this category.)

1. (2 Pts.) A calculator cost $20.00 with rechargeable batteries. There is a 15% price increase with these batteries. What is the price without rechargeable batteries?

ANS. _____

2. (3 Pts.) A new high-speed computer printer operates 3.5 times faster than an older printer. Together they print 1,350 lines per minute. How many lines per minute does the new machine print?

ANS. _____

3. (5 Pts.) The surface area of the earth covered by water is approximately 3.617×10^{8} km^{2}. If this represents 70.92 percent of the earth's total surface area, what is the total surface area of the earth?

ANS. _____

Algebra I Word Problems **Name:** _____

2 points A trip takes 5 hours in a car moving 40 miles per hour. How long would the trip take in a 100 mile per hour train?

_____

3 points Laurie can bake a cake in 2 hours. Jill can bake a cake in 5 hours. Working together, how long would it take to bake the cake?

_____

5 points For the first 5 hours of a flight, a plane is assisted by a 100-mile per hour wind. For the next 3 hours, it is hindered by a 100-mile per hour wind. If the total distance traveled is 3400 miles, how fast is the plane in windless conditions?

_____

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. Algebra I Word Problems

1. (2 Pts.) A young adult may be defined as someone older than 21, but less than 30 years of age. Express this statement using inequalities.

ANS. _____

2. (3 Pts.) In a 100 meter race, Mike crosses the finish line 5 meters ahead of Dan. To even things up, Mike suggests to Dan that they race again, this time with Mike lining up 5 meters behind the start.

a) Assuming Mike and Dan run at the same pace as before, does the second race end in a tie? ANS. _____
b) If not, who wins? ANS. _____
c) By how many meters does he win? ANS. _____

3. (5 Pts.) From #2, how far back should Mike start so that the race ends in a tie?

ANS. _____