Word Problem Test **Name**_____

Age Problems

Problem 1. Mike is 12 years older than Julie. **7 years ago,** Mike was six less than three times Julie's age. **Find their ages today.**

Names	Ages	**– 7 yrs**
Mike	**j + 12**	**j + 5**
Julie	**j**	**j – 7**

Mike = 3 (Julie) – 6

$j + 5 = 3(j - 7) - 6$
$j + 5 = 3j - 21 - 6$
$j + 5 = 3j - 27$
$5 + 27 = 3j - j$
$32 = 2j$
$16 = j$

Mike = 28

Julie = 16

Problem 2. Tina is 3 years younger than Wanda, and Melvin is 3 times as old as Tina. **Six years ago,** Melvin's age was twice the sum of the girls' ages. **Find their present ages.**

Names	Ages	**– 6 yrs**
Tina	**t**	**t – 6**
Wanda	**t + 3**	**t – 3**
Melvin	**3t**	**3t – 6**

Melvin = 2 [Tina + Wanda]

$3t - 6 = 2[t - 6 + t - 3]$
$3t - 6 = 2(2t - 9)$
$3t - 6 = 4t - 18$
$-6 + 18 = 4t - 3t$
$12 = t$

Tina = 12

Wanda = 15

Melvin = 36

Integer Problems

Problem 3. Find three **consecutive even integers** such that four times the sum of the first and third integers is twenty less than six times the middle integer.

First: 2n
Second: 2n + 2
Third: 2n + 4

4 (First + Third) = 6 (Second) – 20

$4(2n+2n+4) = 6(2n+2) - 20$
$4(4n+4) = 12n+12-20$
$16n+16 = 12n-8$
$16n-12n = -8-16$
$4n = -24$
$n = -6$

First= – 12

Second = – 10

Third = – 8

Problem 4. Five times the smallest of three **consecutive odd integers** is ten more than twice the largest. **Find the integers.**

First: 2n + 1 = 6
Second: 2n + 3 = 8
Third: 2n + 5 = 10

5 (First) = 2 (Third) +10

$5(2n+1) = 2(2n+5)+10$
$10n+5 = 4n+10+10$
$10n+5 = 4n+20$
$10n-4n = 20-5$
$6n = 15$
$n = 2\frac{1}{2}$

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Number Problems

Problem 5. The sum of three numbers is one hundred twenty-three. The second number is two more than than twice the first number. The third number is five less than three times the first number. **Find the three numbers.**

One:	x
Other:	2x + 2
Another:	3x – 5
	123

One + Other + Another = 123

$x + 2x + 2 + 3x - 5 = 123$

$6x - 3 = 123$

$6x = 123 + 3$

$6x = 126$

$x = 21$

One = 21

Other = 44

Another = 58

Problem 6. The sum of two integers is 10. Three times the larger integer is three less than eight times the smaller integer. **Find the numbers.**

One:	x
Other:	10 – x
	10

3 (One) = 8 (Other) – 3

$3x = 8(10 - x) - 3$

$3x = 80 - 8x - 3$

$3x + 8x = 77$

$11x = 77$

$x = 7$

One = 7

Other = 3

Problem 7. Twenty increased by five times the sum of a number and two, is the same as six decreased by three times the number. **What is the number?**

Number: n

$20 + 5 (n + 2) = 6 - 3n$

$20 + 5n + 10 = 6 - 3n$

$30 + 5n = 6 - 3n$

$5n + 3n = 6 - 30$

$8n = -24$

$n = -3$

Number = – 3

Mixture Problems

Problem 8. At the Golden Oldies Theater, tickets for adults cost $5.50 and tickets for children cost $3.50. **How many of each type of ticket** was purchased if 21 tickets were bought for $83.50?

	Amount # Tickets	Price $	Total
Adult	**t**	**5.50**	**5.50t**
Children	**21 – t**	**3.50**	**73.50 – 3.50t**
Total	**21**		**83.50**

Total Adults + Total Children = Total Gate

$5.50t + 73.50 - 3.50t = 83.50$

$2t = 83.50 - 73.50$

$2t = 10.00$

$t = 5$

Adult = 5 tickets

Children = 16 tickets

Problem 9. Fifty kilograms of oats worth 90¢/kg is added with some corn worth 60¢/kg to make some animal feed worth 75¢/kg. **How many kilograms of corn** were used in the mixture?

Ingredients	Amount kg	Price $	Total
Oats	**50**	**.90**	**45.00**
Corn	**x**	**.60**	**.60x**
Feed	**x + 50**	**.75**	**.75x + 37.50**

Total Oats + Total Corn = Total Feed

$45 + .60x = .75x + 37.5$

$45 - 37.5 = .75x - .60x$

$7.5 = .15x$

$\frac{7.5}{.15} = \frac{.15x}{.15}$

$50 = x$

Corn = 50 kg

Problem 10. Pixie dust worth $1.80/g is mixed with leprechaun gold worth $2.10/g to make a 100g mixture of magical treasure worth $190.50. **How many grams of each ingredient are used?**

Ingredients	Amount (g)	Price $	Total
Pixie Dust	**x**	**1.80**	**1.80x**
Leprechaun Gold	**100 – x**	**2.10**	**210 –2.10x**
Treasure	**100**		**190.50**

Total Pixie Dust + Total Leprechaun Gold = Total Treasure

$1.80x + 210 - 2.10x = 190.50$

$-.30x + 210 = 190.50$

$-.30x = 190.50 - 210$

$-.30x = -19.5$

$\frac{-.30x}{-.30} = \frac{-19.5}{-.30}$

$x = 65$

Pixie Dust = 65g

Lep. Gold = 35g

Coin & Stamp Problems

Problem 11. A collection of stamps consists of 3¢ stamps, 5¢ stamps, and 7¢ stamps. There are six more 3¢ stamps than 5¢ stamps, and two more 7¢ stamps than 3¢ stamps. The total value of the stamps is $1.94. How many 3¢ stamps are in the collection?

Stamps	Amount # stamps	Value ¢	Total Value
Stamp A	**x + 6**	3	**3x + 18**
Stamp B	**x**	5	**5x**
Stamp C	**x + 8**	7	**7x + 56**
Total			**194**

T Stamp A + T Stamp B + T Stamp C = Total Value

$3x + 18 + 5x + 7x + 56 = 194$

$15x + 74 = 194$

$15x = 120$

$x = 8$

Stamp A = 14

Problem 12. John has thirty five coins consisting of pennies, nickels, dimes, and quarters. He has three times as many quarters as nickels. John has one more penny than dimes. He has two more dimes than nickels. What is the total value of John's change?

Coins	Amount # coin	Value ¢	Total Value
Pennies	**n + 3**	1	**8(.01) = .08**
Nickels	**n**	5	**5(.05) = .25**
Dimes	**n + 2**	10	**7(.10) = .70**
Quarters	**3n**	25	**15(.25) = 3.75**
Total	**35**		**4.78**

CP + CN + CD + CQ = CM

$n + 3 + n + n + 2 + 3n = 35$

$6n + 5 = 35$

$6n = 30$

$n = 5$

Collection = $ 4.78

Technology Problems: Do not work these out by hand, simply zero them out and use the calculator to solve them. Answer to **four decimal places** when appropriate.

A. $2.197(5.12x-3)=14.231x+5$

A. **x = –3.8865**

B. $m^2-5m=11$

B. **x = – 1.6533 , 6.6533**

C. $\frac{4p-3}{5}=\frac{7p+5}{2}-\frac{3p+9}{5}$

C. **x = – .6190**

Solving Literal Equations

1. $\frac{1}{C}=\frac{1}{B}+\frac{3}{E}$ For E

1. $E=\frac{3CB}{B-C}$

2. $A=\frac{1}{2}h(x+y)$ For y

2. $\frac{2A}{h}-x=y$

3. $\frac{5}{9}(F-32)=C$ For F

3. $F=\frac{9}{5}C+32$

4. $A=S(5-MK)$ For K

4. $K=\frac{5}{M}-\frac{A}{SM}$

$$\frac{1}{C} = \frac{1}{B} + \frac{3}{E}$$

$$\left[\frac{1}{C} = \frac{1}{B} + \frac{3}{E}\right] \cdot CBE$$

1. $BE = CE + 3CB$

$BE - CE = 3CB$

$E(B - C) = 3CB$

$$E = \frac{3CB}{B - C}$$

$$A = \frac{1}{2}h(x + y)$$

$$\left[A = \frac{1}{2}h(x + y)\right] \cdot 2$$

2. $2A = h(x + y)$

$$\frac{2A}{h} = x + y$$

$$\frac{2A}{h} - x = y$$

$$\frac{5}{9}(F - 32) = C$$

$$\left[\frac{5}{9}(F - 32) = C\right]9$$

3. $5(F - 32) = 9C$

$$(F - 32) = \frac{9C}{5}$$

$$F = \frac{9C}{5} + 32$$

$$A = S(5 - MK)$$

$$\frac{A}{S} = 5 - MK$$

4. $$MK = 5 - \frac{A}{S}$$

$$K = \frac{5 - \frac{A}{S}}{M}$$

$$K = \frac{5}{M} - \frac{A}{SM}$$

Word Problem Test **Name_____Key_____**

Solve each Problem. Show all work on test.

Problem 1. Larry is three years older than twice Moe age. Curly is two years older than Moe. **Two years ago**, the sum of Larry's and Moe's age was four more than double Curly's age. **What is their present ages.**

Names	Ages	**– 2 yrs**
Larry	**2m + 3**	**2m + 1**
Curly	**m + 2**	**m**
Moe	**m**	**m – 2**

Larry + Moe = 2[Curly] + 4

$2m + 1 + m - 2 = 2m + 4$

$3m - 1 = 2m + 4$

$3m - 2m = 4 + 1$

$m = 5$

Larry = 13

Curly = 7

Moe = 5

Problem 2. Find three **consecutive odd integers** so that five times the second, decreased by twice the third, is equal to fifty-three. **Find the integers.**

First: 2n + 1
Second: 2n + 3
Third: 2n + 5

5 (Second) – 2 (Third) = 53

$5(2n + 3) - 2(2n + 5) = 53$

$10n + 15 - 4n - 10 = 53$

$6n + 5 = 53$

$6n = 53 - 5$

$6n = 48$

$n = 8$

First= 17

Second = 19

Third = 21

Problem 3. Pixie dust worth \$1.95/g is mixed with leprechaun gold worth \$2.25/g to make a 200g mixture of magical treasure worth \$436.50. **How many grams of each ingredient are used?**

Ingredients	Amount (g)	Price \$	Total
Pixie Dust	**x**	**1.95**	**1.95x**
Leprechaun Gold	**200 – x**	**2.25**	**450-2.25x**
Treasure	**200**		**436.50**

Total Pixie Dust + Total Leprechaun Gold = Total Treasure

$1.95x + 450 - 2.25x = 436.50$

$-.3x + 450 = 436.50$

$-.3x = 436.50 - 450$

$-.3x = -13.5$

$\frac{-.3x}{-.3} = \frac{-13.5}{-.3}$

$x = 45$

Pixie Dust = 45g

Lep. Gold = 155g

Problem 4. Mike has some pennies, nickels, dimes, and quarters worth \$6.31. There are four fewer dimes than twice the number of quarters. There are two more nickels than quarters. There are four more nickels than the number of pennies. **How many of each type of coin did Mike have?**

Coins	Amount # coin	Value ¢	Total Value
Pennies	**q – 2**	1	**q – 2**
Nickels	**q + 2**	5	**5q + 10**
Dimes	**2q – 4**	10	**20q – 40**
Quarters	**q**	25	**25q**
Total			**631**

Total (P + N + D + Q) = Total Value

$51q - 32 = 631$

$51q = 631 + 32$

$51q = 663$

$q = 13$

Pennies = 11
Nickels = 15
Dimes = 22
Quarters = 13

Problem 5. Ground chuck sells for \$2.05 per pound. **How many pounds of ground round** selling for \$3.45 per pound should be mixed with 23 pounds of ground chuck to obtain a mixture that sells for \$2.99 per pound?

Ingredients	Amount (lbs)	Price \$	Total Value
Ground Chuck	**23**	**2.05**	**47.15**
Ground Round	**x**	**3.45**	**3.45x**
Mixture	**x + 23**	**2.99**	**2.99x + 68.77**

Total Chuck + Total Round = Total Mixture

$$47.15 + 3.45x = 2.99x + 68.77$$
$$3.45x - 2.99x = 68.77 - 47.15$$
$$.46x = 21.62$$
$$\frac{.46x}{.46} = \frac{21.62}{.46}$$
$$x = 47$$

47 lbs ground round

Problem 6. Eight pounds of milk chocolate that sells for \$5.00/lbs and some magic beans worth \$11.65/lbs are mixed to make some really neat treat worth \$9.75/lbs. **Find how many lbs of magic beans are needed to make the mixture?**

Ingredients	Amount (lbs)	Price \$	Total Value
Milk Chocolate	**8**	**5.00**	**40.00**
Magic Beans	**x**	**11.65**	**11.65x**
Neat Treat	**x + 8**	**9.75**	**9.75x + 78.00**

Total Chocolate + Total Beans = Total Treat

$$40 + 11.65x = 9.75x + 78$$
$$11.65x - 9.75x = 78 - 40$$
$$1.9x = 38$$
$$\frac{1.9x}{1.9} = \frac{38}{1.9}$$
$$x = 20$$

Magic Beeans = 20 lbs

Problem 7. Find three **consecutive even integers** such that twice the sum of the first and third integers is twenty-one more than the second integer.

First: 2n
Second: 2n + 2
Third: 2n + 4

5 [First + Third] = Second + 21

$2[2n+2n=4]=2n+2+21$
$2(4n+4)=2n+23$
$8n+8=2n+23$
$8n-2n=23-8$
$6n=15$
$n=2\frac{1}{2}$

First: 2n = 5
Second: 2n + 2 = 7
Third: 2n + 4 = 9

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Problem 8. A stamp collection consists of 3¢, 8¢, and 13¢ stamps. The number of 8¢ stamps is three less than twice the number of 3¢ stamps. The number of 13¢ stamps is twice the number of 8¢ stamps. The total value of all the stamps is $2.53. **How many 3¢ stamps are in the collection?**

Stamps	Amount # stamps	Value ¢	Total Value
Stamp A	**a**	3	**3a**
Stamp B	**2a – 3**	8	**16a – 24**
Stamp C	**4a – 6**	13	**52a – 78**
			253

Total A + Total B + Total C= Total Value

$3a+16a-24+52a-78=253$
$71a-102=253$
$71a=355$
$a=5$

5 stamps @ 3¢

Problem . Cory has a collection of pennies, nickels, dimes, and quarters. There is two more nickels than four times the number of dimes. There are three more pennies than twice the number of dimes. Finally there are five more quarters than the number of pennies. If you take the expressions found for the **total value** of the collection (in terms of cents) that would be **equal** to forty three more than ten times the **total number of coins** in the collection. **Find the value of all the coins in the collection.**

Coins	Amount # coin	Value ¢	Total Value
Pennies	**2d + 3**	1	**2d + 3**
Nickels	**4d + 2**	5	**20d +10**
Dimes	**d**	10	**10d**
Quarters	**2d + 8**	25	**50d + 200**
Total	**9d +13**		**82d + 213**

Total Value = 10 [Total # coins] + 43

$82d + 213 = 10[9d + 13] + 43$

$82d + 213 = 90d + 130 + 43$

$82d + 213 = 90d + 173$

$213 - 173 = 90d - 82d$

$40 = 8d$

$5 = d$

$82(5) + 213 = 623$

Total Value = $6.23

Technology Problems: Do not work these out by hand, simply zero them out and use the calculator to solve them. Answer to **four decimal places** when appropriate.

D. $\sqrt{w-1} + w^2 = -9$ D. {}

E. $q^4 + 3 = 5q^2 - 3q^3$ E. $-4.1602, -.6757$

F. $\ln(5t^2) - 2t^2 = -3$ F. $-1.6804, 1.6804$
$-.1008, .1008$

Literal Equations 1

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the formula for the specified variable.

1) $d = rt$ for r

$\frac{d}{t} = \frac{r \cdot t}{t}$

$\frac{d}{t} = r$

A) $r = d - t$ B) $r = dt$ C) $r = \frac{d}{t}$ D) $r = \frac{t}{d}$

1) C

2) $I = Prt$ for t

$\frac{I}{Pr} = \frac{Prt}{Pr}$

$\frac{I}{Pr} = t$

A) $t = \frac{P - 1}{Ir}$ B) $t = \frac{P - I}{1 + r}$ C) $t = P - Ir$ D) $t = \frac{I}{Pr}$

2) D

3) $A = \frac{1}{2}bh$ for b

$2\left[A = \frac{1}{2}bh\right]$

$\frac{2A}{h} = \frac{bh}{h}$

$\frac{2A}{h} = b$

A) $b = \frac{Ah}{2}$ B) $b = \frac{h}{2A}$ C) $b = \frac{2A}{h}$ D) $b = \frac{A}{2h}$

3) C

4) $V = \frac{1}{3}Bh$ for h

$3\left[V = \frac{1}{3}Bh\right]$

$\frac{3V}{B} = \frac{Bh}{B}$

$\frac{3V}{B} = h$

A) $h = \frac{B}{3V}$ B) $h = \frac{V}{3B}$ C) $h = \frac{3V}{B}$ D) $h = \frac{3B}{V}$

4) C

5) $P = a + b + c$ for c

$P = a + b + c$

$P - a - b = c$

A) $c = a + b - P$ B) $c = P - a - b$ C) $c = P + a - b$ D) $c = P + a + b$

5) B

6) $P = 2L + 2W$ for W

$\frac{P - 2L}{2} = \frac{2W}{2}$

$\frac{P - 2L}{2} = W$

A) $W = P - L$ B) $W = \frac{P - L}{2}$ C) $W = \frac{P - 2L}{2}$ D) $W = d - 2L$

6) C

7) $A = P + PRT$ for T

$A - P = PRT$

$\frac{A - P}{PR} = T$

A) $T = \frac{A - P}{PR}$ B) $T = \frac{PR}{A - P}$ C) $T = \frac{A}{R}$ D) $T = \frac{P - A}{PR}$

7) A

8) $A = \frac{1}{2}h(B + b)$ for b

$2A = h(B + b)$

$\frac{2A}{h} = B + b$

$\frac{2A}{h} - B = b$

$\frac{2A - Bh}{h} = b$

A) $b = \frac{2A - Bh}{h}$ B) $b = \frac{2A + Bh}{h}$ C) $b = \frac{A - Bh}{h}$ D) $b = 2A - Bh$

8) A

9) $F = \frac{9}{5}C + 32$ for C

$5F = 9C + 160$

$5F - 160 = 9C$

$\frac{5F - 160}{9} = C$

$\frac{5(F - 32)}{9} = C$

A) $C = \frac{9}{5}(F - 32)$ B) $C = \frac{5}{F - 32}$ C) $C = \frac{5}{9}(F - 32)$ D) $C = \frac{F - 32}{9}$

9) C