Algebra   **Mixed Word Problem Practice**   Name_____ Per__

Number Problems
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1. The sum of two numbers is 48. If the smaller number is subtracted from the larger, the difference is 12. Find the numbers.

The #'s are 30 & 18.

x - larger # $x + y = 48$ $\frac{2x=60}{2\;\;\;2}$ $30 + y = 48$
y - smaller # $+\;x - y = 12$ $-30 \qquad -30$
$\qquad\qquad\qquad\overline{2x = 60}$ $x = 30$ $y = 18$

2. One number is 4 more than half of another. The difference between the two numbers is 2. Find the numbers.

x - 1st # $x = 4 + \frac{1}{2}y$ $4 + \frac{1}{2}y - y = 2$ $x = 4 + \frac{1}{2}(4)$
y - 2nd # $x - y = 2$ $-4 \qquad\quad -4$ $x = 6$
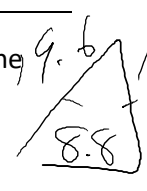The #'s are 4 & 6. $-2\left(-\frac{1}{2}\right)y = (-2) - 2$
$\qquad\qquad\qquad\qquad\qquad y = 4$

3. One positive number equals 3 times another number. The difference between the numbers is 1. Find the numbers.

x - 1st # $x = 3y$ $x - y = 1$ $x = 3\left(\frac{1}{2}\right)$ The numbers
y - 2nd # $3y - y = 1$ $x = 1.5$ are 1.5 and 0.5.
$\qquad\qquad \frac{2y}{2} = \frac{1}{2}$ $y = \frac{1}{2}$

Perimeter Problems
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4. The perimeter of an isosceles triangle is 48 in. The length of the base is 1 in less than half the length of one of the two equal sides. Find the lengths of the sides of the triangle.

x - equal side $2x + y = 48$ $2x + \frac{1}{2}x - 1 = 48$
y - base $y = \frac{1}{2}x - 1$ $+1 \qquad +1$
$\qquad\qquad\qquad y = \frac{1}{2}(19.6) - 1 \quad y = 8.8$ $\frac{2.5x = 49}{2.5 \quad 2.5}$ $x = 19.6$

5. The perimeter of a rectangle is 10 m. Twice the width is equal to one-half the length. Find the length and width.

w - width $2w + 2l = 10$ $\frac{1}{2}L + 2L = 10$ $2w = \frac{1}{2}(4)$
l - Length $2w = \frac{1}{2}L$ $\frac{2.5L = 10}{2.5 \quad 2.5}$ $\frac{2w}{2} = \frac{2}{2}$
The length is 4m and $L = 4$ $w = 1$
the width is 1m.

6. The perimeter of a triangular sign is 21 ft. If the lengths of two sides are equal and the third side is 3 ft longer than one of the equal sides, find the lengths of the three sides.

x - length of = sides $2x + y = 21$ $2x + x + 3 = 21$
y - longer side $y = x + 3$ $-3 \quad -3$
$\qquad\qquad\qquad\qquad y = 6 + 3$ $\frac{3x = 18}{3 \quad 3}$
The sides are 6 ft, 6 ft, & 9 ft. $y = 9$ $x = 6$

Money & Fund Raising Problems

$17 + 6 = 26$
$-17 \quad -17$
$6 = 9$

7. Lorena has 26 coins in nickels and quarters, which are worth a total of $3.10. How many of each coin does she have?

$n - \#$ of nickels
$q - \#$ of quarters
9 quarters and
17 nickels.

$4(0.05n + 0.25q) = (3.10)4$
$n + q = 26$
$-(0.20n + q = 12.40)$
$0.8n = 13.6$

$\dfrac{0.8n = 13.6}{0.8 \quad 0.8}$
$n = 17$

8. To raise funds, the math club sells two kinds of raffle tickets, some for $6, others for $1.50. Sales for both amounted to $822. If 371 tickets were sold, how many were $1.50 tickets?

$x - \#$ of $6 tickets
$y - \#$ of $1.50 tickets
59 $1.50 tickets
were sold

$6x + 1.50y = 822$
$x + y = 371 \quad x = 371 - y$
$-y \quad -y$
$6(371 - y) + 1.50y = 822$
$2226 - 6y + 1.50y = 822$

$\dfrac{-4.5y = -1404}{-4.5 \quad -4.5}$
$y = 312$
$x = 371 - 312$
$x = 59$

9. George saves nickels and dimes for tools. If he has 28 coins worth $2.60, how many are nickels and how many are dimes?

$n - \#$ of nickels
$d - \#$ of dimes

$-10(.10d + .05n) = (2.60)^{-10}$
$d + n = 28$
$+ \quad -d - .5n = -26$
$.5n = 2$
$\dfrac{.5n = 2}{-.5 \quad -.5}$

$n = 4$
$d + 4 = 28$
$-4 \quad -4$
$d = 24$
4 nickels and 24 dimes.

Age Problems

10. Cordell is twice as old as Beth. Eight years ago he was 3 times as old. How old are Cordell and Beth now?

$C -$ Cordell's age
$B -$ Beth's age
Cordell is 32 &
Beth is 16.

$C = 2B$
$C - 8 = 3(B - 8)$
$2B - 8 = 3(B - 8)$
$2B - 8 = 3B - 24$

$2B - 8 = 3B - 24$
$-2B + 24 \quad -2B + 24$
$16 = B$
$C = 2(16)$
$C = 32$

11. In two years Peter will be twice as old as his sister Joyce. The sum of their present ages is 26. How old are Peter and Joyce?

$P -$ Peter's age
$J -$ Joyce's age
Peter is 18 and
Joyce is 8.

$P + 2 = 2(J + 2)$
$P + J = 26$
$-J \quad -J$
$P = 26 - J$

$26 - J + 2 = 2J + 4$
$+ J \quad + J$
$28 = 3J + 4$
$-4 \quad -4$
$\dfrac{24 = 3J}{3 \quad 3}$

$J = 8$
$P = 26 - 8$
$P = 18$

12. Six years ago Bill was 17 years younger than twice Ann's age. Now their combined age is 100 years. Find their present ages.

$B -$ Bill's age
$A -$ Ann's age

$B - 6 = 2(A - 6) - 17$
$100 - A - 6 = 2A - 12 - 17$
$+ A \qquad + A$
$94 = 3A - 29$
$+29 \qquad +29$
$\dfrac{123 = 3A}{3 \quad 3}$
$41 = A$

$B + A = 100$
$-A \quad -A$

$B = 100 - A$
$B = 100 - 41$
$B = 59$
Ann is 41 and
Bill is 59.