Example 1

You need 5 pounds of fruit in order to make a fruit salad. Apples are $1.88 per pound and oranges cost $1.28 per pound.

If you spend a total of $8.50 on fruit, how many pounds of each kind did you buy?

$$\$ \quad 1.88a + 1.28o = 8.50$$
$$\# \quad a + o = 5$$
$$\underline{-o \quad -o}$$
$$a = 5 - o$$

$$\boxed{a = 3\tfrac{1}{2} \text{ lbs} \\ o = 1\tfrac{1}{2} \text{ lbs}}$$

$$1.88(5-o) + 1.28o = 8.5$$
$$9.4 - 1.88o + 1.28o = 8.5$$
$$9.4 - .6o = 8.5$$
$$\underline{-9.4 \qquad -9.4}$$
$$\underline{-.6o = -.9}$$
$$\underline{-.6 \quad -.6}$$
$$o = 1\tfrac{1}{2} \text{ lbs}$$

Example 2

Tommy has 4 times as many quarters as dimes. If he has $7.70 total, how many of each coin does he have?

$$\$ \quad .25q + .1d = 7.7$$
$$\# \quad q = 4d$$

28 quarters
7 dimes

$$.25(4d) + .1d = 7.7$$
$$1d + .1d = 7.7$$
$$1.1d = 7.7$$
$$\underline{1.1 \qquad 1.1}$$
$$d = 7$$

Example 3

The sum of a daughter and mother's ages is 74. Twice the daughters age is 2 less than her mom's age. Find their ages.

$$d + m = 74$$
$$2d = m - 2$$
$$\underline{+2 \qquad +2}$$
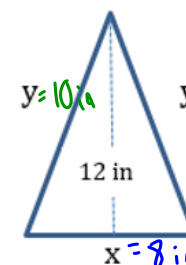$$2d + 2 = m$$

Mom = 50
daughter = 24

$$d + 2d + 2 = 74$$
$$3d + 2 = 74$$
$$\underline{-2 \quad -2}$$
$$\frac{3d}{3} = \frac{72}{3}$$
$$d = 24$$

Example 4

The perimeter of an isosceles triangle is 28 inches. The area of the triangle is 48 square inches. What are the lengths of the sides of the isosceles triangle?

$$P: \quad x + 2y = 28$$
$$A: \quad A = \tfrac{1}{2}bh$$
$$48 = \tfrac{1}{2}(x)(12)$$
$$\frac{48 = 6x}{6 \quad 6}$$
$$8 = x$$

$$x + 2y = 28$$
$$8 + 2y = 28$$
$$\underline{-8 \qquad -8}$$
$$2y = 20$$
$$y = 10$$