SOLVING ALGEBRAIC WORD PROBLEMS

PRAXIS FLASHCARD #76, #364, and #221

CONSECUTIVE NUMBERS

Numbers that follow each other in counting order are called **consecutive**. They can be denoted as x, x + 1, x + 2, x + 3, etc. Consecutive odd numbers are x, x + 2, x + 4, etc. (assuming x is odd), and consecutive even numbers are also x, x + 2, x + 4, etc. (assuming x is even). **Example:** Find three consecutive, even numbers whose sum is 90.

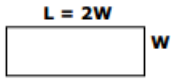
x + (x + 2) + (x + 4) = 90
3x + 6 = 90
3x = 84
x = 28 so the numbers are **28, 30, 32**

PRAXIS FLASHCARD #77

RECTANGULAR AREA & PERIMETER

Problems involving area & perimeter require use of formulas: **P = 2L + 2W**, where P = Perimeter, L = length, W = width. **A = LW**, where A = area. **Example:** The length of a rectangle is twice its width. If the perimeter of the rectangle is 60 in, find its area.

L = 2W so P = 2(2W) + 2W
60 = 4W + 2W
60 = 6W
W = 10 and since L = 2W
L = 20
Knowing this, A = LW = 20(10) = **200 in^2**

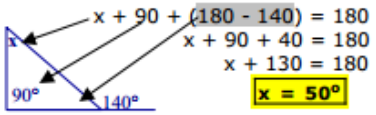


PRAXIS FLASHCARD #78

TRIANGLES

Problems involving triangles require you to know facts about triangles, such as: Two angles that form a straight line (180°) are supplementary. The sum of the measures of the interior angles of a triangle is 180°.

Example: Find the unknown angle (x):



x + 90 + (180 - 140) = 180
x + 90 + 40 = 180
x + 130 = 180
x = 50°

PRAXIS FLASHCARD #79

UNIT CONVERSION

Set up **unit conversion problems** as a proportion. Then cross multiply (Means- Extremes Property) and simplify. (Unit analysis may also be used – see the flashcard on unit analysis.) **Example:** Convert 16 yards to feet. Because there are 3 feet in 1 yard:

yard	1	16
feet	3	??

Cross multiply: 3 x 16 = **48 feet**

PRAXIS FLASHCARD #80

MIXTURES

Problems involving mixtures use $M_1V_1 + M_2V_2 = M_tV_t$, where M is the percentage of each mixture, and V is the volume or amount of each mixture. **Example:** How much of a 16% solution is needed to combine with 34 ml of a 12% solution to make 50 ml of a 15% solution?

0.16x + 0.12(34) = 0.15(50)
16x + 12(34) = 15(50)
16x + 408 = 750
16x = 342
x = 21.375 ml

PRAXIS FLASHCARD #81

INVESTMENTS

Problems involving investments require use of the interest formula: ***I=Prt***, where *I* = interest earned, *P* = principal (original amount), *r* = annual rate of interest, and *t* = time in years. **Example:** An investment is made at 5% simple interest for 12 years. It earned $420 interest. How much was originally invested?

```
420 = P(.05)(12)
420 = 0.6P
4200 = 6P
P = 4200/6
P = $700
```

PRAXIS FLASHCARD #82

DISCOUNTS

Problems involving discounts require use of the discount formula: ***S = r - rd***, where *S* is the sale price, *r* is the retail price, and *d* is the rate of discount. **Example:** A coat is on sale for $125. If the coat was discounted 20%, what was the original retail price?

```
125 = r – (0.2)r
125 = (0.8)r
(multiply both sides by 10 to clear decimal)
1250 = 8r
r = 1250/8
r = $156.25
```

PRAXIS FLASHCARD #83

COMMISSIONS

When we think of **sales commissions**, we often think of car sales. Thus, it is appropriate that the formula for commission is ***C = ar***, where *C* = commission earned, *a* = amount of sale, and *r* = commission rate.

Example: Juana sells cars on a 3% commission rate. She just sold a car for $23,500. What was her commission?

```
C = ar
C = 23500(.03)
C = $705
```

PRAXIS FLASHCARD #84

DISTANCE--RATE OF SPEED--TIME

The **distance formula** is ***D = rt***, where *D* is the distance traveled, *r* is the rate of speed, and *t* is the time.

$r = \frac{D}{t}$ to calculate the rate of speed $\qquad$ $t = \frac{D}{r}$ to calculate the time

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PRAXIS FLASHCARD #85

UNIFORM MOTION

In problems where you are given data about an object traveling **with** and then **against** a moving object, use a table, and then set the SAME quantities equal to each other & solve. The distance formula is **D = rt**

	D	r	t
Direction One Way			
Opposite Direction			

Example: A boat can travel 12 mi/hr in still water. If the boat can travel 5 mi downstream in the same time it takes to travel 3 mi upstream, what is the rate of the river's current?

	D	r	t=D/r
Direction One Way	5	$12 + c$	$\frac{5}{12+c}$
Opposite Direction	3	$12 - c$	$\frac{3}{12-c}$

$$Set\ \frac{5}{12+c} = \frac{3}{12-c}\ and\ solve\ for\ c.$$
