

Chap 2

Problem Solving 2

① Let $x = \#$ of jeweled
 $25 - x = \#$ of enameled
 $3x = \#$ of jeweled
 $2(25 - x) = \#$ enameled
 $3x + 2(25 - x) = 65$
 $3x + 50 - 2x = 65$
 $x = 15$

Then: 15 Jeweled
 10 enameled

Now: 45 jeweled
 20 enameled

② Let $x = \#$ one BR
 $50 - x = \#$ two BR

28 one BR
 22 two BR

$$185,900x + 195,900(50 - x) = 9,515,000$$

$$185,900x + 9,795,000 - 195,900x = 9,515,000$$

$$10,000x = 280,000$$

$$x = 28$$

③ a) $x = \text{speed}$
 $24x = 2000$
 $x = 83\frac{1}{3} \text{ mph (wind)}$

b) $36x = 2000$
 $x = 55\frac{20}{36} = 55\frac{5}{9} \text{ mph}$ or ≈ 55.6

④ Let $x = \text{principal at } 9\%$
 $6400 - x = \text{principal at } 8\%$

\$4000 at 9%
 \$2400 at 8%

$$.09(2.5)x + .08(2.5)(6400 - x) = 1380$$

$$.225x + 1280 - .2x = 1380$$

$$.025x = 100$$

$$x = \$4000$$

KEY

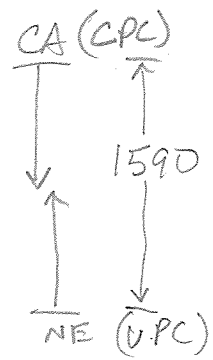
Name _____

Advanced Algebra (H)

Problem Solving Strategies

1. In 1862, two railroad companies were given the rights to build a railroad connecting Omaha, Nebraska, with Sacramento, California. The Central Pacific Company began building eastward from Sacramento in 1863. Twenty-four months later the Union Pacific Company began building westward from Omaha. The Central Pacific Company averaged 7.5 miles of track per month. The Union Pacific Company averaged 20 miles of track per month. The two companies met in Promontory, Utah, as the 1590 miles of track were completed. How long, from the time the Central Pacific Company began, did it take the construction of the railroad line? How many miles of track did each company build?

let $x = \# \text{ months (UPC)}$
 $x + 24 = \# \text{ month (CPC)}$
 $8.75(x + 24) + 20x = 1590$
 $8.75x + 210 + 20x = 1590$
 $28.75x = 1380$
 $x = 48$



How long a time?
 $48 + 24 = 72 \text{ months}$

miles of CPC
630 miles
miles of UPC
960 miles

2. You have started a small business making papier-mache sculptures. Your cost per sculpture is only \$0.50. Your pieces sell for \$12.50 at an arts-and-crafts shop, and you receive 50% of the selling price. Each sculpture takes about 2 hours to complete. If you spend 16 hours a week working on the sculptures, how many weeks will you work to earn a profit of \$400?

$\frac{16}{2} = 8 \text{ sculptures/week}$
 50% price
 let $x = \# \text{ weeks}$
 $8x = \# \text{ sculptures}$

Revenue - Cost = Profit
 $\frac{12.50}{2} (8x) - .50(8x) = 400$
 $100x - 4x = 800$
 $96x = 800$
 $x = 8\frac{1}{3}$

9 weeks

profit \$414

8 99 99
 9 8
 891 792