## **Verbal Problems Applied Worksheet**

Astronomy:

- The bright star Castor is about 45 light-years from Earth, the star Pollux about 33. How far are these stars from each other? These stars are the two important stars in the constellation Gemini and are quite close to each other in the sky. Use this information to get a close approximation to the distance between Castor and Pollux.
- 2. Here are some data about the Earth, Moon. And Sun.

	Diameter	Distance from Earth
Earth	8,000 mi	0
Moon	2,200 mi	240,000 mi
Sun	864,000 mi	93,000,000 mi

Suppose you wished to make a scale drawing of Earth, Sun, and Moon. If the Earth is represented by a circle with a diameter of 2 cm:

- A) How far away will the Moon be?
- B) How large will the Moon be?
- C) How far away will the Sun be?
- D) How large will the Sun be?

## Geography:

- 3. The radius of Earth is about 6170 km. The highest point on the Earth (Mount Everest) is about 8850 m above sea level and the lowest point (Marianas Trench) is about 11,000 m below sea level. If these extremes were represented on a relief globe 30 cm in diameter, how high (and low) would they be?
- 4. In 1974 India had a population of 586 million and a net annual rate of population increase [births + immigration deaths emigration] of about 2%. If this rate remained the same, what might the population be in 1984?

Everyday Life (Travel):

5. The usual charge for traveler's checks is a fixed percentage of the face value. In May 1976, a bank offered a "Vacationer's Special": Up to \$ 5,000 of traveler's check for a fixed \$2.00 charge. This was described as a savings of "up to 96% of the usual charge." What is the usual charge for \$5,000 of traveler's checks?

Health:

- A proponent of natural foods recently claimed that each day there are 25 tons of aspirin consumed in the U.S. What does this mean in terms of aspirin tablets per person per day? Assume that one aspirin tablet contains 5 grains of aspirin, 1 lb. = 7000 grains (avoirdupois units), and U.S population is 210 million.
- 7. A person in a hospital is to be given 1000 cc of a 5% glucose solution intravenously over a period of 8 hours. The nurse adjusts the apparatus and checks the flow by counting the number of drops for one minute. If the flow is correct, how many drops should she count? (Assume 1 cc= 15 drops)

## **Environmental Science**

- 8. The formula  $C = (20t)^2$  200t + 600 describes the concentration C of bacteria per cubic centimeter in a body of water t days after treatment to show bacterial growth. After how many days will the concentration be 100 bacteria per cubic centimeter?
- 9. Trees are to be planted in a row. Their positions are recorded on a grid, and two of them are located at (0,-3) and (2,-1). If the third tree is planted at (7,6) will this tree be aligned (on the same line) with the other two?
- 10. The Antarctic glacier flows  $84\frac{3}{5}^{3}$  yards in a week; the Greenland glacier flows  $236\frac{9}{10}$  yards in the same time. How much farther does the Greenland glacier flow in a week?

Vertal Proteterio Applied Worksheet (1) 45 light yrs. (Calter) - 33 light yr. (Pollux) [12 lignt year (approx.) ( Earth: Diameter = 2 cm 8,000 mil = 44,000 miles per a cons 4,000 mi = 2000 mi/cm diameter = 2,200 m 0.200 mi = 2000 mi 2000xmy/cm = 2.200 mi (3) X = 1.1 cm \$40,000 mi = 2000 mi 1 cm x cm (x) 6000 m1/cm = 240,000 m1/cm 2000 m A = 100 cm Distance from Farth 93 million miles Diameter: 204,000 miles Sun: 23.000,000 mi = 2000 mi

 $\frac{2}{1000} \frac{1}{1000} = \frac{2.000}{1000} \frac{1}{1000}$ A Citt 864.000 mile = 200 miler (B) X= 432 cm

13,000,000 mi/cm= 2000 mi (x cm) (C) X= 465,000 cm

1 cm

x cm

$$\frac{3}{30 \text{ cm} (\text{diameter of} \\ \text{reliff globe})}{3(6170 \text{ km})(\frac{\text{dometer of}}{\text{Eartn}})} = \frac{x}{(2 \cdot 6170) + 5850 \text{ km}(\frac{\text{highest pt of}}{\text{Mt. Evercet}})}$$

$$\frac{(35i700 = 12,340x}{12,340} = \frac{x}{12,340}$$

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$$\frac{51.52 \text{ cm} (\text{Eartn} + \text{Mt. Everent})}{-30.00 \text{ cm} (\text{Eartn} + \text{Mt. Everent})}$$

$$\frac{30 \text{ cm} (\frac{\text{diameter}}{12,340} = \frac{x}{12,340} = \frac{x}{12,340}$$

$$\frac{30 \text{ cm} (\frac{\text{diameter}}{12,340} = \frac{x}{12,340} = \frac{x}$$

④ 1974 → 586,000,000 people in India.

population increase > 2.0% net annual What will the population be in 10 years? 175 > 586 million (.02) = 11,720,000 586,000,000 + 11,720,000 597,920,000 176 → 597,720,000 (.02) = 11,954,400 597,720,000 +11,954,400 609,674,400 177 > 621,867,888 178 -> 634,305,245 179 > 646,991,349 180 -> 659,931,175 181 -> 673,129,798 182 > 686,592,393 183 > 700, 324, 240 184 > 714, 335, 724 people approximately (3) May 1976 → \$\$5 \$ Onech for \$2.00 charge → Savings up to 96~1.
what Charge: \$\$2.00 is 4010 of what? > 4 100 = .04
hence: 2.00 .04 = 50
Usual Charge: \$50.00

() as tons of appirin condumed/day > 50,000 lbs. 1 tablet = 5 grains of appirin 1 16 = 7,000 graino U.S. population = 210 million # of tablets taken per perion each day? 5 grains = 1400 tablets in 116 7,000 grans 350,000,000 grains = 5x grains 1 person 350 million = 210 million (5×) 350 million = 105,000,000 x 105,000,000 105,000,000 X# 3 tablets of appirin per person per day

(\*) 1000 CC of 5+1\* glucoic over 8 house  
1000 CC of 5+1\* glucoic over 8 house  
8 hr = 8( 60 min) = +80 min  
8 hr  
So. 1000 CC = 
$$\frac{1}{2}$$
  
48 min I min  
 $x \le 2.08 = 2.00 \Rightarrow Sina 1cc = 15 drap \Rightarrow 2cc (15 drap/icc) = 30 drap/min)$   
(\*) C = 120L <sup>2</sup> - 200L +1600  
100 = 400L<sup>2</sup> - 200L +1600  
100 = 400L<sup>2</sup> - 200L +1600  
100 L<sup>2</sup> - 200L +500 = 0  
 $x = \frac{(-200) \pm \sqrt{1200}^2 - 4(400)(100)}{2(400)}$   
8 y guadratic bimula:  
 $2 + 400$   
 $b = -200 = x = \frac{b \pm \sqrt{b^2 + 4ac}}{2a}$   
(\*)  $x = \frac{14 \pm i\sqrt{19}}{2a}, x = \frac{14 \pm i\sqrt{19}}{4}$   
C = 500  
(\*)  $x = \frac{-3 - 1}{2a} = \frac{-2}{2} = 1$   
(\*)  $x = \frac{14 \pm i\sqrt{19}}{4}, x = \frac{14 + i\sqrt{19}}{4}, x = \frac{14 - i\sqrt{19}}{4}$   
(\*)  $x = \frac{14 \pm i\sqrt{19}}{4}, x = \frac{14 + i\sqrt{19}}{4}, x = \frac{14 - i\sqrt{19}}{4}$   
(\*)  $x = \frac{14 \pm \sqrt{19}}{2a}, x = \frac{14}{2} = 1$   
(\*)  $x = \frac{14}{2}, \frac{16}{2}, \frac{16}{2}$ 

(B) 8435 = 84.6 yardo per week → Antarctic glacier 236970 = 256.9 yardo per week → Greenland glacier How much further does the circenland glacier flow a week?

1236.9 The Carcentand glacier flows - 84.0 152.3 more yordo per week 152.3