Student: _____ **Instructor:** Andreas Lazari
Date: _____ **Course:** Math1111-Summer2018 **Assignment:** Section 1.3 Homework

1. According to statistics, a person will devote 31 years to sleeping and watching TV. The number of years sleeping will exceed the number of years watching TV by 19. Over the lifetime, how many years will the person spend on each of these activities? Let X = # of years watching TV
$X+19$ = # of years sleeping
$X + X + 19 = 31 \Rightarrow 2X = 31 - 9$
$2X = 12 \Rightarrow X = 6$

The person will spend 6 years watching TV and 25 years sleeping.
(Type whole numbers.)

$X + 19 = 6 + 19 = 25$ sleeping

2. Suppose the average yearly salary of an individual whose final degree is a master's is \$34 thousand less than twice that of an individual whose final degree is a bachelor's. Combined, two people with each of these educational attainments earn \$119 thousand. Find the average yearly salary of an individual with each of these final degrees.
X = Bachelors = 51
$2X - 34$ = Masters $2(51) - 34 =$
$2X - 34 + X = 119$
$3X = 119 + 34 = 153$
$\Rightarrow X = \frac{153}{3} = 51$

The average yearly salary for an individual whose final degree is a bachelor's is \$ 51 thousand and the average yearly salary for an individual whose final degree is a master's is \$ 68 thousand.

3. A new car worth \$27,000 is depreciating in value by \$3,000 per year. Complete parts **a.** through **b.** below.

   a. Write a formula that models the car's value, y, in dollars, after x years.

   $y = 27000 - 3000X$

   b. Use the formula from part (a) to determine after how many years the car's value will be \$3,000.

   After 8 years, the car's value will be \$3,000.

   $27000 - 3000X = 3000 \Rightarrow 3000X = 24000$
   $X = \frac{24000}{3000} = 8$

4. You are choosing between two health clubs. Club A offers membership for a fee of \$20 plus a monthly fee of \$26. Club B offers membership for a fee of \$12 plus a monthly fee of \$30. After how many months will the total cost of each health club be the same? What will be the total cost for each club?
$20 + 26X = 12 + 30X \Rightarrow 30X - 26X = 20 - 12$
$4X = 8 \Rightarrow X = 2$

In 2 months the total cost of each health club will be the same.

The total cost for each health club will be \$ 72.
$20 + 26(2) = 20 + 52 = 72$

5. The bus fare in a city is \$2.00. People who use the bus have the option of purchasing a monthly coupon book for \$30.00. With the coupon book, the fare is reduced to \$1.00. Determine the number of times in a month the bus must be used so that the total monthly cost without the coupon book is the same as the total monthly cost with the coupon book.
$2X = 30 + X \Rightarrow 2X - X = 30 \Rightarrow X = 30$

The bus must be used 30 times.

6. In 2004, there were 11,900 students at college A, with a projected enrollment increase of 1100 students per year. In the same year, there were 27,900 students at college B, with a projected enrollment decline of 500 students per year.

   According to these projections, when will the colleges have the same enrollment? What will be the enrollment at that time?

   In what year will the two colleges have the same enrollment? 2014 (in 10 years)
   $11900 + 1100X = 27900 - 500X$
   $1100X + 500X = 27900 - 11900$
   $1600X = 16000 \Rightarrow X = 10$ years
   $2004 + 10$ years $= 2014$

   At that time, how many students will be enrolled in each college? 22900
   $11900 + 1100(10) = 11900 + 11000 = 22900$

7. After a 60% reduction, you purchase a new soft drink machine on sale for $240. What was the original price of the soft drink machine?

$(1-.60)X = 240 \Rightarrow .4X = 240 \Rightarrow X = \frac{240}{.4} = 600$

The original price was $ 600 .

8. Including a 7% sales tax, an inn charges $177.62 per night. Find the inn's nightly cost before tax is added.

$ 166

$X + .07X = 177.62 \Rightarrow 1.07X = 177.62 \Rightarrow X = \frac{177.62}{1.07} = 166$

9. You invested $29,000 in two accounts paying 6% and 8% annual interest, respectively. If the total interest earned for the year was $1940, how much was invested at each rate?

X = investment at 8% = 10000

The amount invested at 6% is $ $29000 - 10000 = 19000$.

The amount invested at 8% is $ 10000 .

$.08X + .06(29000 - X) = 1940$

$.08X + 1740 - .06X = 1940$

$.02X = 1970 - 1740 \Rightarrow .02X = 200 \Rightarrow X = \frac{200}{.02} = 10000$

10. The length of a new rectangular playing field is 5 yards longer than quadruple the width. If the perimeter of the rectangular playing field is 580 yards, what are its dimensions?

The width is 57 yards.

The length is $4(57)+5 = 233$ yards.

$2X + 2(4X+5) = 580$

$2X + 8X + 10 = 580$

$10X = 580 - 10$

$10X = 570 \Rightarrow X = 57$

11. Solve the formula for q.

T = C + qf

$q = \frac{T-C}{f}$

$T = C + qf \Rightarrow qf = T - C \Rightarrow q = \frac{T-C}{f}$

12. Solve the following formula for t.

Q = D + Drt

$t = \frac{Q-D}{Dr}$ (Simplify your answer.)

$Q = D + Drt \Rightarrow Q - D = Drt \Rightarrow t = \frac{Q-D}{Dr}$

13. Solve S = 2HW + 2HL for H.

$H = \frac{S}{2W+2L}$

$S = 2HW + 2HL$

$S = H(2W+2L)$

$\Rightarrow H = \frac{S}{2W+2L}$

1. $\frac{6}{25}$

2. $\frac{51}{68}$

3. $\frac{27,000 - 3,000x}{8}$

4. $\frac{2}{72}$

5. 30

6. $\frac{2014}{22,900}$

7. 600

8. 166

9. $\frac{19,000}{10,000}$

10. $\frac{57}{233}$

11. $\frac{T - C}{f}$

12. $\frac{Q - D}{Dr}$

13. $\frac{S}{2W + 2L}$