AChor/MFM2P **Name: _____**

Date: _____

Worksheet 5-7: Solving Word Problems with Algebraic Models

1. The total cost of a one-week holiday at a resort can be modelled using formula $C = p + 0.05p + 0.07p + 0.12p$. C is the total cost in dollars. p is the list price of accommodation/meal package in dollars. 0.05 is the provincial tax rate, 5%. 0.07 is the GST rate, 7%. 0.12 is the service charge rate, 12%. Find the list price when the total cost of the holiday is $2170.

2. In the formula $s = \frac{w - 7e}{t}$, s is speed in words per minute, w is the number of words typed, e is the number of errors, and t is the time in minutes.

(a) Solve for e.

(b) Simon has a speed of 72 words per minute. He typed 500 words in 5 minute. How many errors did he make?

3. $I = \Pr t$ shows how the amount of simple interest, *I*, earned on an investment is related to the amount invested or the principal in dollars, *P*, the interest rate, *r*, in decimals, and the time, *t*, of the investment in years. Damon deposits $500 into a savings account that pays simple interest at a rate of 0.65% per year. How long will it take Damon to earn $130 in interest?

4. A local restaurant features a live band. The bill for food and beverages must be added the 13% HST and a 12% service charge (tips). The restaurant also adds a cover charge of $25 (for taking a table). If *x* represents the cost for food and beverages, the total cost in dollars, *C*, can be calculated using the equation: $C = x + 0.13x + 0.12x + 25$. Ms. Chor's total bill was $308.50. How much was the bill for Ms. Chor's food and beverage only?

5. In the formula $A = \frac{1}{2}h(a+b)$, A is the area in square units. h, a and b are the dimensions of a trapezoid.

(a) Solve the formula for h

(b) Find the height when $A = 24\text{ cm}^2$, $a = 3\text{ cm}$ and $b = 5\text{ cm}$.

6. $A = P(1+rt)$ where A is the accumulated amount in dollars, P is the principal, or initial investment, in dollars, r is the annual simple interest rate (a percent expressed as a decimal), and t is the time in years. What is the annual simple interest rate for investing $500 and receiving $582.50 in 3 years?

Answers: 1. (a) $1750**; 2. (a)** $e = \frac{st-w}{-7}$**, (b)** 20 errors**; 3.** 40 years**; 4.** $226.80**; 5. (a)** $h = \frac{2A}{a+b}$**, (b)** 6 cm**; 6.** 5.5%