Tutorial A: Extra Practice Problems (Unit 1-3)

Unit 1: Algebra

1. Solve for the unknown.

$a)\ 5y+9=2y-3$ $\quad b)\ 3-2t=5-5t$

$c)\ 3(y-2)-2(y-3)=-11$ $\quad d)\ 5(3-a)-2(a-7)=113$

$e)\ \dfrac{3}{5-2x}=\dfrac{7}{2}$ $\quad f)\ \dfrac{2y-3}{4}=\dfrac{6y+7}{3}$

$g)\ \begin{cases}3x+2y=8\\ x-12y=-10\end{cases}$ $\quad h)\ \begin{cases}2x-y=13\\ 4x+3y=1\end{cases}$

$i)\ \begin{cases}2x+6y=26\\ 5x-3y=11\end{cases}$ $\quad j)\ \begin{cases}3x+4y=29\\ 2x-5y=-19\end{cases}$

$k)\ \begin{cases}y=9-x\\ y=11-2x\end{cases}$ $\quad l)\ \begin{cases}y=1-x\\ y=-11+3x\end{cases}$

2. The average cost, *A*, in dollars, of producing *n* videos is given by the formula: $A=\dfrac{12\,000+3n}{n}$.

   a) What would be the average cost if 5 000 videos were produced?

   b) How many videos would have to be produced for the average cost to be $3.25?

3. The formula: $\dfrac{L+2D-F+\sqrt{A}}{2.37}=12$ is used to classify yachts. If *L*=16.6, *D*= 0.2, and *F*= 1.26, determine the sail area required for a yacht with these dimensions.

4. The cost of 4 L of oil and 50 L of gasoline is $42.50. The cost of 3 L of oil and 35 L of gasoline is $30.30. Find the cost of 1 L of oil and 1 L of gasoline.

5. For a school play, Janis sold 6 adult tickets and 15 student tickets, and collected $48. Parviz sold 8 adult tickets and 7 student tickets, and collected $38. Find the cost of adult and student tickets.

6. The coin box of a vending machine contains $6.20 in dimes and quarters. There are 32 coins in all. Find how many of each kind are there?

7. The Ontario Science Centre charges $20 for adult admissions and $13 for child admissions. If there were 400 adults and children at the Ontario Science Centre in one day and the total revenue was $ $6250, how many adults were there?

Unit 2: Linear Coordinate Geometry, Linear Systems of Equations and Applications

1. Suppose there is a linear relationship between number of election pamphlets printed in hundreds, x, and the cost of printing those pamphlets, y.

Number of Election Pamphlets x	Cost of Printing y
0	
400	$300
1 200	$500
2 500	

a) Determine the equation relating the total number of election pamphlets printed and the printing cost in the form y=mx +b.

b) State the slope and what it represents in words?

c) Find the missing values in the chart.

d) What is the y-intercept and what does it mean in words?

e) If another company's printing cost model for election pamphlets is given by $y = 0.15x + 350$, determine the number of election pamphlets that needs to be printed so that the cost of printing will be the same for both companies.

2. A cable TV company charges a fixed monthly fee for a basic plan, plus a fee per specialty station ordered by the customer. Shown below are two values where *x* represents the number of specialty stations ordered and *y* represents the monthly total amount owing.

Number of Specialty Station x	Monthly Total Amount Owing y
10	95
15	127.50

Use the information in the chart to find:

a) The equation in the form y= mx+b

b) The meaning of the slope in the context of this problem

c) The meaning of the y-intercept in the context of this problem

d) If another cable company operates under the model, $y = 5x + 45$, determine the number of specialty stations subscribed such that both model will charge the same monthly amount.

Unit 3: Percent

1. An item in a store was priced at $239.50. During a sale, its price is reduced by 25%.
   a) Determine its new price.
   b) If the H.S.T. is applied to the sale priced, determine the total amount paid with tax included. (In Ontario H.S.T. is 13%.)

2. An investment made together by Karen and Andre increased in value to $25 000 by the end of one year. This represented a gain of 8% on the original investment.

   a) Find the amount they invested together at the beginning of the year.

   b) If Andre invested $4 000 more than Karen, how much did each invest?

3. The table below represents some data collected from participants in a study done each year. Some data is missing. The number of participants polled each year is the same.

	2008	2009	2010	2011 (projected)
employed	424	477		462

   a) Find the percentage increase in those employed from 2008 to 2009.

   b) The percentage increase in the projection for those employed in 2011 is projected to be 5%. How many people were employed in 2010?

4. The table below shows the water consumption per person in a certain year.

Year	1970	1976	2004	2021
Consumption		120	160	

   a) A 275% increase in consumption is predicted from 2004 to 2021. Calculate the predicted consumption in 2021.
   b) Calculate the percent increase in consumption from 1976 to 2004.
   c) There was an increase of 20% water consumption from 1970 to 1976. Calculate the consumption in 1970.

Solutions:

Unit 1

1a) y = -4 1b) t=2/3

1c) y=-11 1d) a = -12

1e) $\frac{29}{14}$ 1f) $\frac{-37}{18}$

1g) (x,y) = (2,1) 1h) (x,y) = (4,-5)

1i) (x,y) = (4,3) 1j) (x,y) = (3,5)

1k) (x,y) = (2,7) 1l) (x,y) = (3, -2)

2a) $5.40 2b) n=48 000

3) 161.29

4) 1L oil = $2.75; 1 L gasoline = $0.63

5) adult ticket = $3/ ticket; student ticket = $2/ticket

6) 12 dimes and 20 quarters

7) 150 adults and 250 children

Unit 2

1a) y= 0.25x + 200 1b) m = 0.25; It costs $0.25 to print per pamphlet

1c) When x = 0, y = 200; When x = 2500, y = 825 1d) y intercept = 200; it costs $200 to place an order.

1e) 1500 pamphlets

2a) y = 6.5x + 30 2b) m = 6.5; It costs $6.50 per specialty channel

2c) b = 30; $30 is the fixed monthly fee 2d) 10 specialty channel

Unit 3

1a) $179.63 1b) $202.98

2a) $23148.15 2b) Andre - $13 574.07; Karen - $ 9 574.08

3a) 12.5% increase 3b) 440

4a) 600 4b) 33.33% increase 4c) 100