Name:_____   SEC.2 Math

Xmas Exam Review Pack – C2 & C3

Graphs ~ Lessons 1 to 4

1.   Melanie wants to take hip-hop dance lessons.
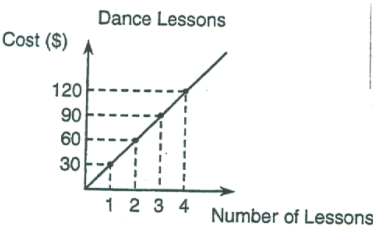
She checks out four schools that interest her.

The information about the cost of the lessons for each school is shown below.

Which school offers the cheapest option per lesson?

School 1:   Dance lessons cost $25 each.   School 3:   Nine lessons cost $180.
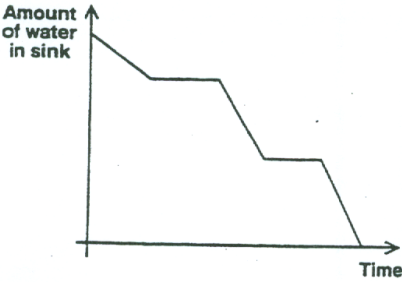
School 2:

Dance Lessons
Cost ($)

120
90
60
30

1 2 3 4   Number of Lessons

School 4 :

Dance Lessons

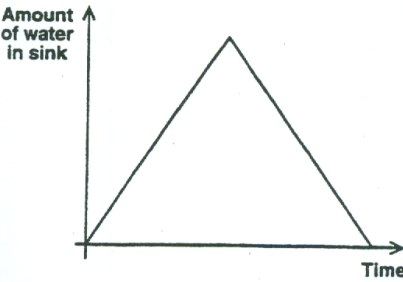| Number of Lessons	1	2	3	4
Cost ($)	22	44	66	88

2.   Dennis decides to wash the dishes. He fills the sink with water, washes the dishes, rinses them several times under the faucet and then empties the sink. Which of the following graphs represents this situation?
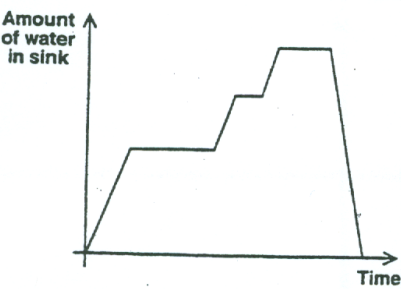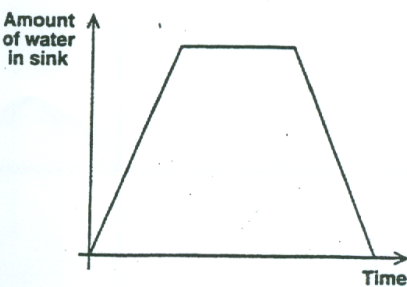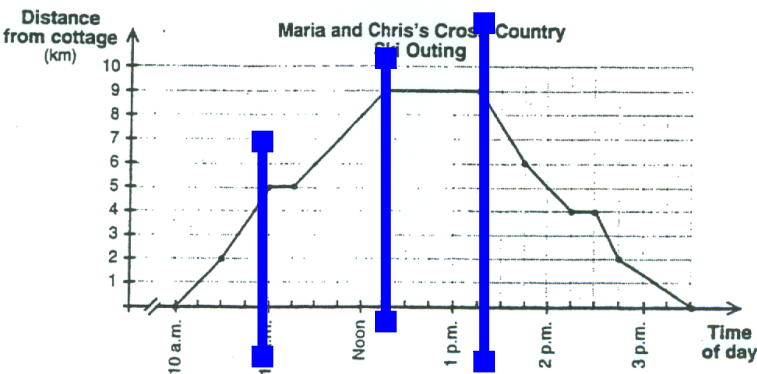
A)

Amount of water in sink

Time

B)

Amount of water in sink

Time

C)

Amount of water in sink

Time

D)

Amount of water in sink

Time

3. On a beautiful Saturday afternoon in February, Maria and Chris leave their cottage to go cross-country skiing. Midway through their outing, they stop at a rest area to eat. The graph shown below illustrates their trip.

a) At what time did Maria and Chris stop to eat?

b) How far is the rest area from the cottage?

c) How long did it take them to reach the rest area?

d) Before arriving at the rest area, they stopped to wax their skis. What time was it then?

e) What was the total distance they skied?

f) Calculate the following ratio: $\dfrac{\text{time to reach the rest area}}{\text{time to return to the cottage}}$

g) What percent of the trip do the rest times represent?

4. Complete the table of values.

Quantity of gasoline (L)	0	1	2	4	10	12	18	25	30
Price ($)	0	0.59		2.36					

5. Janine, a maple syrup producer, kept a record of last season's production. On average, 50 L of maple sap were used to produce one L of syrup.

Complete the table of values.

Quantity of sap (L)		2000		50 000	60 000	n
Quantity of syrup (L)	1		60			

2

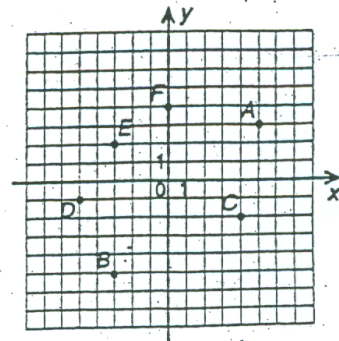**6.** Find the coordinates of the points represented on this Cartesian plane.

A(_____ , _____)

B(_____ , _____)

C(_____ , _____)

D(_____ , _____)

E(_____ , _____)

F(_____ , _____)

7.

Francis buys a cup that he wants to decorate in a ceramics workshop. The cost of his project consists of a set amount for the purchase of the cup and some paint, as well as an hourly wage for the time during which he will use the workshop's installations. The table of values below describes this situation.
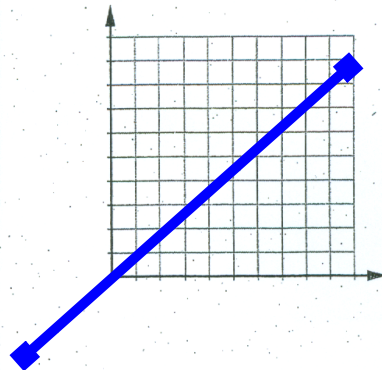
Francis' personalized cup

Time (h)	0	1	2	3	5	8
Cost ($)	3	9	15	21	33	51

a) What does the ordered pair (5, 33) represent in this situation?

_____

_____

b) If Francis takes 6 h to decorate his cup, how much will his personalized cup cost him?

_____

c) Determine the rule for calculating the total cost c of the cup, according to the time t spent in the shop decorating it.

_____

d) Use a graph to represent this situation.

8.

To become a member of a video club, you must first get a membership card that costs $5, then pay $3 for each videocassette rented.

a) Is this a proportional situation? _____

b) Illustrate this situation by using a table of values.

3

Algebra - Lessons 5 to 10

Match the algebraic expressions from the column on the right to the descriptions on the left.

9.

a) Two a minus three b.

b) The product of 3 and the square of a.

c) The quotient of b and two times a.

d) Half of b increased by a third of a.

e) The sum of a and two times a.

f) The square of b reduced by a.

g) Twice the difference between a and b.

h) The number following whole number b.

i) The sum of two consecutive numbers when the first is a.

j) The number that comes before whole number $a + 2$.

1. $a + 2a$

2. $2(a - b)$

3. $2a - 3b$

4. $a + (a + 1)$

5. $3a^2$

6. $b + 1$

7. $b^2 - a$

8. $\dfrac{b}{2a}$

9. $a + 1$

10. $\dfrac{b}{2} + \dfrac{a}{3}$

10.

Three groups of Secondary II students organize a campaign to finance their participation in the Québec Games. Group 1 collects an amount equal to 3 times the amount gathered by Group 2. Group 3 collects $60 less than the total of the other two groups.

a) If the variable x represents the amount raised by Group 2, write the algebraic expression that represents the total amount raised by all three groups.

b) How much would be raised in all if Group 2 collects $50?

c) How much would be raised in all if Group 1 collects $210?

d) How much would Group 2 have to collect for the total to equal $740?

11. Simplify the following expressions. Show all your work.

a) $x + 4x - (-5x) - 2$

b) $(2a + 1) - (a - 5)$

12.

Find the value of the following algebraic expressions   Given: $a = 1$, $b = -3$, $c = 2$

a) ~~$2a + b^2 + 5c$~~

$4a + b^2 + 3c$

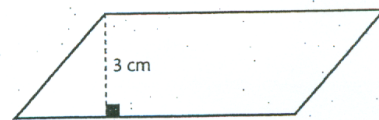b) $4(a - 2b) - 2c$

4

13.

Calculate the following products and quotients.

a) $3 \times 4a =$ _____

b) $8 \times 6b^2 =$ _____

c) $2a \times 9b =$ _____

d) $4b \times 7b =$ _____

e) $28d \div 4 =$ _____

f) $48bc \div 12 =$ _____

g) $36b^2 \div 9 =$ _____

h) $25pq \div 4 =$ _____

i) $5(3x + 2y) =$ _____

j) $4(5a^2 - z^2) =$ _____

k) $3(9bc + 4b) =$ _____

l) $7(8bz - 6y^2) =$ _____

14.

The area of the parallelogram on the right can be described by the algebraic expression $81xy$. What algebraic expression can be used to describe the measure of its base?

3 cm

15.

What algebraic expression can be used to describe the area of the rectangle on the right?

$4b$

$3a$
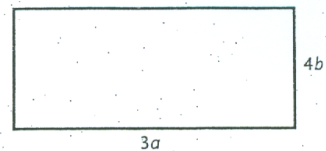
Equations - Lessons 11 to 15

Solve these equations.

16.

a) $12(2a - 7) - 20 = 16a - 56$

b) $\frac{4b - 3}{3} + 7 = 22.8$

17. DELEGATIONS

In the Olympic Village, Canadian athletes share a pavilion with athletes from three other countries: Germany, Mexico and the United States.

- The Canadian delegation has 20 athletes more than four times the Mexican delegation.

- The German delegation has 388 athletes more than the Mexican delegation.

- The delegation from the United States has twice as many athletes as the Canadian delegation.

- In this pavilion, the number of athletes is 1568.

The Canadian athletes are housed two per room. The cost of one room for the duration of the Games is $625.

A budget of $100 000 has been provided to house the Canadian athletes.

Is the budget adequate to cover the cost of accommodations? Explain why.

18. The width of a rectangular photo is 2 cm less than its height.

Its perimeter is 24 cm.

Carolyn had the photo enlarged in the ratio 6 : 1.

What are the dimensions of the enlarged photo?

Proportions - Lessons 16 to 19

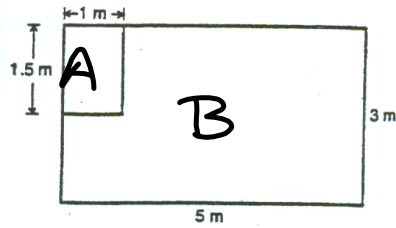**19.** Two rectangles are shown.

a) Write the ratio of the lengths of the: A:B

1) heights;

2) bases;

3) perimeters;

4) areas.

b) Are these two rectangles similar figures?

20. Calculate the unit rate in each case.

a) 2 kg of peanut butter for $8.54.

b) $2.10 for 5 stamps.

c) 4 L of orange juice for 8 children.

d) 150 mL of maple syrup produced from 6 L of sap.

21. John earns pocket money by babysitting his neighbour's children. He charges a fixed hourly rate.

a) Is this a proportional situation?

b) Complete the table.

Time (h)	0		2	5	
Rate ($)		2.50	5.00		25.00

c) What is the constant of proportionality? coefficient

d) What is John's hourly rate?

e) Last year, John babysat approximately 225 h. Find how much money he earned if he was paid the same hourly rate all year.

22. The perimeter of a rectangle is 200 m. Find the dimension of this rectangle given that they are in the ratio of 2 to 3.

7
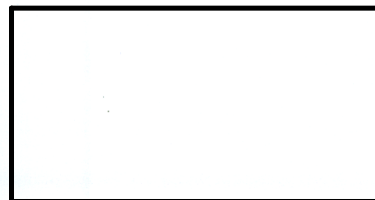
23.

a) At a summer camp, 3 counsellors are hired for every 20 children. If 42 counsellors are hired, how many children can attend the camp?

    A) 126   B) 260   C) 280   D) 840

b) Last month, the ratio of rainy days to days without rain was 3 : 7. How many rainy days were there if it did not rain on 21 days?

    A) 21   B) 7   C) 3   D) 9

c) A shopkeeper hands out 2 rebate coupons for every $5 purchase. How many coupons will she give for purchases totalling $65?

    A) 13   B) 26   C) 35   D) ≈ 7

24. Katia mixes 150 mL of blue gouache with 3 L of white gouache to produce a pale blue.

a) What is the ratio of the amount of blue gouache to the amount of white gouache?

b) Write the proportion that enables you to calculate the amount of blue gouache that, when mixed with 2 L of white, will produce the same shade of pale blue. *Solve*

25. Lynn and Jean are running for school president. A recent survey shows that, out of 12 votes, Lynn with get 5 and Jean will get 7. How many votes will each candidate get if 300 students vote?

26.

Determine whether the tables below are tables of proportional values.

a)

...	...
2	3
3	4.5
5	7.5
8	12

b)

...	...
1	3
2	5
3	7
4	9

c)

...	...
1	0.7
3	2.1
5	3.5
10	7

8

Percents Lessons 20 and 21

27. **Complete** the table.

Fraction	Decimal number	Percent
$\frac{6}{15}$		
	0.625	
		$66\frac{2}{3}$%

28. Karin, Mary and Cynthia have different math teachers. On the last test, Karin got 32/44, Mary got 45/60 and Cynthia got 0.742. **Which student had the best result?**

_____

29. **Determine the value** for each of the following.
    a) 45% of 220. _____   b) 18% of 125. _____   c) 0.5% of 436. _____

30. A sporting goods store is offering a 15% discount on its merchandise. Nadia wants to buy running shoes, regularly priced at $89, and a volleyball, regularly priced at $19.95.

    a) Nadia has $100. **Does she have enough money?** _____

    b) **Complete** the bill and **determine** the total to be paid (including tax).

SPORT PROS	Date: _____
	Name: _____
	Address: _____

Quantity	Description	Unit Price	Total
		$	$
		$	$

Sub-total: $ _____
− Discount: $ _____
Sub-total: $ _____
Tax: $ _____
Total: $ _____

Calculate taxes at a rate of 13.955 %.

9

31. A television regularly priced at $899.95 is marked down by 20%. **By what amount** has the price been reduced?

   _____

32. Oliver deposits $250 in the bank at an annual interest rate of 7.5%. **How much money can he withdraw** after a year?

   _____

33. **Calculate the original price** of these items if the sale price is:

   a) $27.48 after a 12% discount. _____ .

   b) $81 after an 18% discount.   _____

   c) $518.38 after a 40% discount._____

34. According to Statistics Canada, 8.5 million Canadians normally speak French at home. If this represents 32% of Canadians, **what is the total population** of Canada?

   _____

35. If a car originally cost $12 000, and it loses 25% of its value each year:

   a) **Is it true** that the car will be worth nothing after four years? _____

   b) **What will the car be worth** after two years?   _____

36. A school is having a Winter's Day festival, and different activities have been suggested. The principal insists that 75% of students have to sign up before an activity is scheduled. If 76% represents 437 students signed up for a particular activity, **how many students** are there in the school?

   _____

37. Mario spends $150 a month on electricity and heating. This is 4% of his annual income. If he spends 20% of his annual income on rent, **how much does he pay in rent each month**?

   _____