

East Selkirk Middle School

Grade 8 Mathematics Exam

June 19, 2009 OR 2010

Answer KEY

Student Response Booklet

Materials:

You will require the following materials:

- Calculator
- Ruler
- Pencil with eraser

Points To Remember

The total time allowed for writing this test is 120 minutes or 2 hours

- Work alone on this test
- You may use a calculator on any part of this test.
- Notes, notebooks or textbooks may not be used during the test.
- You may use blank scrap paper but it must be handed in at the end of the test. You may do rough work in this booklet.
- If you need more space to answer a question, you may use an extra page provided by your teacher. Write your name and the question number on any extra page used. Staple all pages into your booklet where your answer begins.

Description

Your grade 8 final exam consists of 3 parts:

Part	Description	Suggested Time	Marks
1	Multiple Choice	30	36
2	Constructed Response	60	46
3	Problems	30	18

Directions

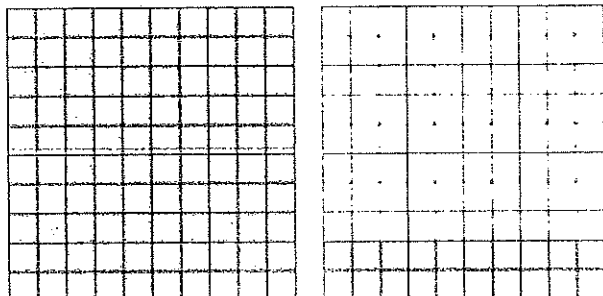
Part 1 : Multiple Choice – Read each question carefully. Choose the best response and mark it on the **Answer Sheet** by shading in the letter of the appropriate bubble with your pencil.

Part 2 : Constructed Response – Provide complete, well-organized answers showing all your thinking. Remember to write neatly.

Part 3 : Problems - Same as part 2. Show all work !

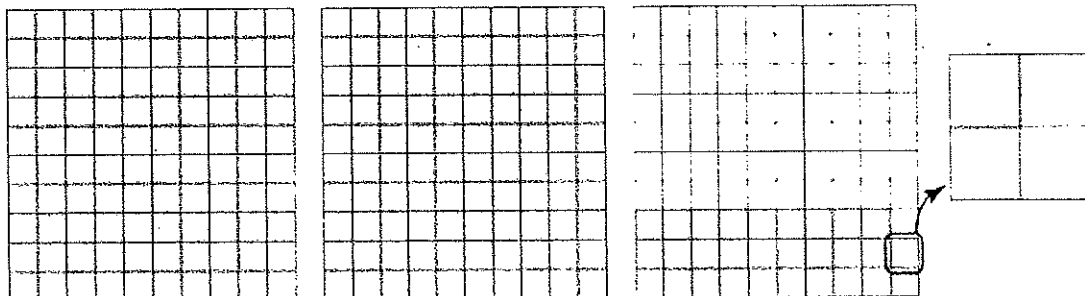
Part 1 : Multiple Choice Questions

1) One completely shaded grid represents 100%. What percent does this diagram represent?



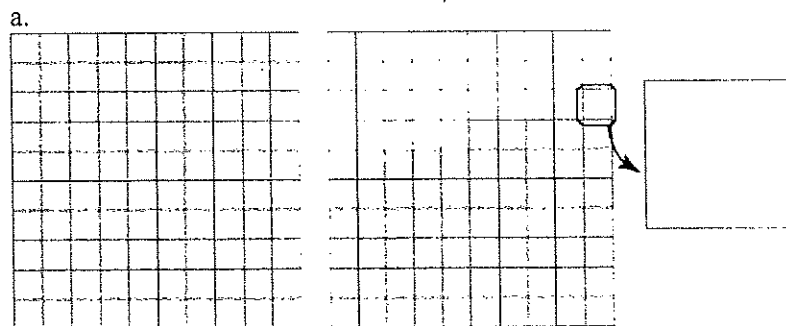
- a. 80% c. 110%
 b. 90% d. 120%

2) What percent is represented by this diagram if a completely shaded grid represents 100%?

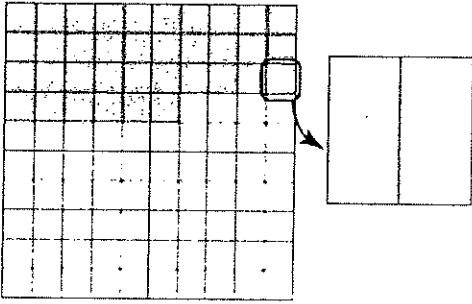


- a. $228\frac{3}{4}\%$ c. $156\frac{3}{4}\%$
 b. $171\frac{1}{4}\%$ d. $128\frac{3}{4}\%$

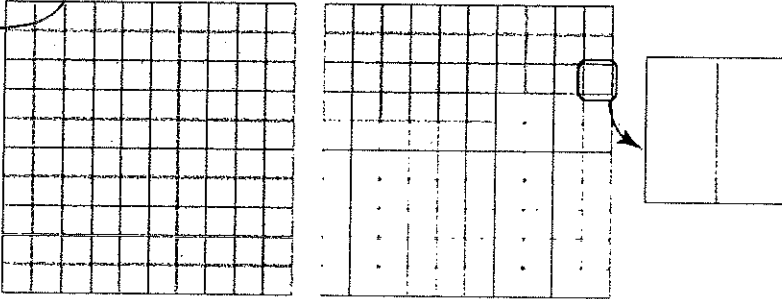
3) One completely shaded grid represents 100%. Which diagram represents $135\frac{1}{2}\%$?



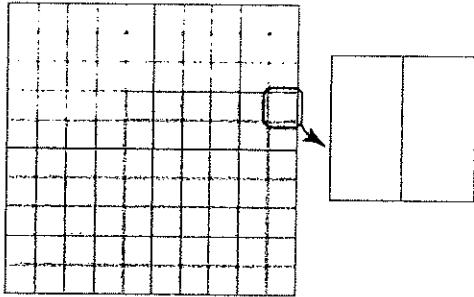
b.



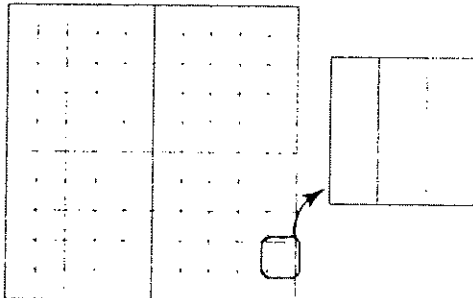
c.



d.



4) One completely shaded grid represents 100%. What percent does this diagram represent?



a. $\frac{2}{3}\%$

c. $66\frac{2}{3}\%$

b. $\frac{1}{3}\%$

d. $33\frac{1}{3}\%$

5) Which percent can be written as 0.65?

- a. 0.65% c. 65%
b. 6.5% d. 650%

6) Jake scored these marks on four tests: 0.75 , $\frac{4}{5}$, 0.85 , and $\frac{18}{20}$. Which is the highest test mark?

- a. 0.75 c. 0.85
b. $\frac{4}{5}$ d. $\frac{18}{20}$

7) In a recent survey, 300 students were asked about the type of pets they own. The results showed that 131 students own dogs, 71 students own cats, 7 students own goldfish, and the rest do not own pets. What percent of students do not own pets?

- a. $79\frac{8}{9}\%$ c. $30\frac{1}{3}\%$
b. $69\frac{2}{3}\%$ d. $20\frac{1}{9}\%$

$$\begin{array}{r} 131 \\ 71 \\ 7 \\ \hline - 300 \\ \hline 91 \end{array} \frac{91}{300} =$$

8) Yuri ate 20% of a bag of pretzels. How much of the bag is left if its original mass was 400 g?

- a. 180 g c. 380 g
b. 320 g d. 800 g

$$.8 \times 400$$

9) Determine the value of x if $\frac{x}{48 \times 6 \times 3} = \frac{7}{3}$.

- a. 16 b. 32 c. 80 d. 112

10) A stable has 39 horses available for trail rides. Of these horses, 26 are all brown, 8 are mainly white, and the rest are black. Express in lowest terms the ratio of brown horses to mainly white horses to black horses.

- a. 13:4:2 b. 13:4:5 c. 26:8:5 d. 39:26:8

$$\begin{array}{l} 26 \text{ Br} \\ 8 \text{ W} \\ 5 \text{ Bl} \end{array}$$

11) Sandra works at a carwash and makes \$8.75/h. After working 5.5 h, Sandra will make

- a. \$48.13 b. \$35.00 c. \$43.75 d. \$57.50

12) Sam borrowed \$240 from his friend Brian. Sam agreed to pay Brian 8% interest per year. How much would Sam need to repay Brian after 18 months? ^{1.5}

- a. \$28.80 b. \$211.20 c. \$259.20 d. \$268.80

0.00797 0.00758

13) The grocery store sells ketchup in different sizes of bottles: 375 mL for \$2.99, 500 mL for \$3.79, 1 L for \$3.99, and 1.5 L for \$5.49. Which size is the best buy?

- 0.00399 0.00366
- a. 375 mL b. 500 mL c. 1 L d. 1.5 L

14) Tye wants to buy a personal DVD player that costs \$249.00. How much money will Tye need to pay for the DVD player if the GST is 5% and PST is 7%?

- a. \$29.88 b. \$32.37 c. \$278.88 d. \$281.37

15) A 4-litre jug of milk is priced at \$4.15. Determine the unit price.

- a. \$0.42 per L b. \$1.04 per L c. \$2.08 per L d. \$4.15 per L

16) Determine $\frac{3}{4} \times \frac{5}{18}$ in lowest terms.

- a. $\frac{5}{6}$ b. $\frac{5}{9}$ c. $\frac{5}{18}$ d. $\frac{5}{54}$

17) Calculate $12 \div \frac{3}{4}$.
 $12 \times \frac{4}{3}$

- a. $\frac{1}{16}$ b. $\frac{1}{9}$ c. 9 d. 16

18) As an improper fraction in lowest terms, what is $\frac{2}{5} \times \left(\frac{2}{3} + \frac{3}{10} \right) \div \frac{8}{15}$?

- a. $\frac{23}{25}$ b. $\frac{11}{15}$ c. $\frac{29}{40}$ d. $\frac{15}{52}$

$\frac{29}{75} \times \frac{15}{8} = \frac{29}{40}$
 $\frac{2}{5} \times \frac{29}{30} = \frac{29}{75}$

19) Calculate $5\frac{2}{3} \times \frac{1}{4}$.

$$\frac{17}{3} \times \frac{1}{4} = \frac{17}{12} = 1\frac{5}{12}$$

- a. $5\frac{1}{6}$ **b.** $1\frac{5}{12}$ c. $\frac{5}{6}$ d. $\frac{1}{30}$

20) Divide $5\frac{1}{5} \div 1\frac{3}{20}$.

$$\frac{26}{5} \div \frac{20^4}{23} = \frac{104}{23} = 4\frac{12}{23}$$

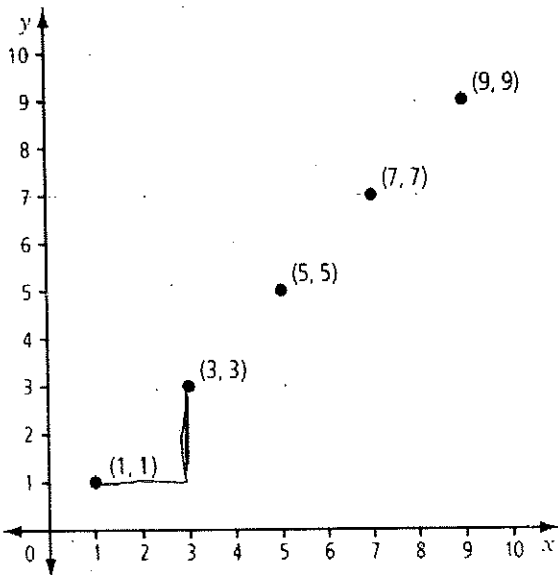
- a. $1\frac{4}{15}$ b. $3\frac{1}{5}$ **c.** $4\frac{12}{23}$ d. $6\frac{2}{3}$

21) Jonathan spends \$45 on clothes and entertainment each month. He spends $\frac{2}{3}$ of this on his clothes. How much does he spend on clothes each month?

- a. \$15 **b.** \$30 c. \$45 d. \$68

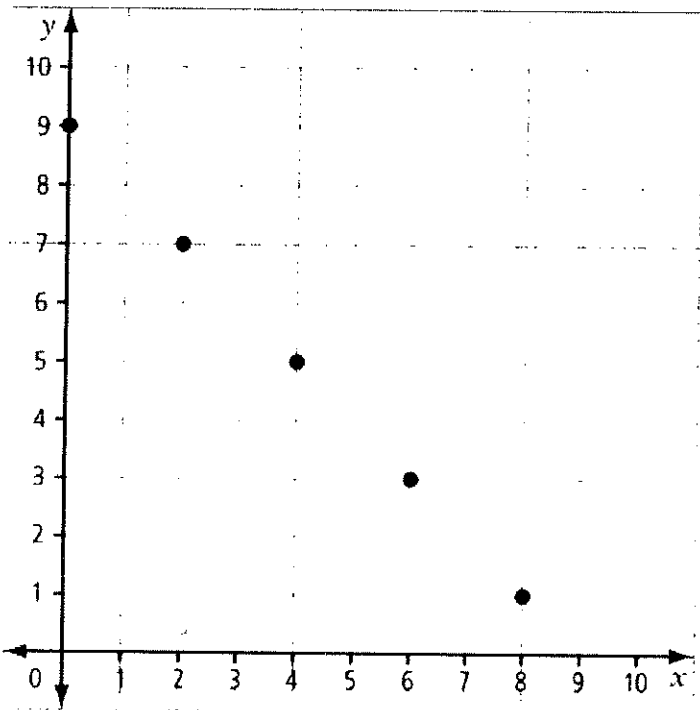
$$\frac{2}{3} \times 45 = 30$$

22) Which statement best describes the pattern of this graph?



- a. To move from one point to the next, you go two units horizontally and three units vertically.
b. To move from one point to the next, you go two units horizontally and two units vertically.
 c. To move from one point to the next, you go three units horizontally and three units vertically.
 d. To move from one point to the next, you go three units horizontally and two units vertically.

23) Which table of values represents this graph?



a.

x	y
9	0
7	2
5	4
3	6
1	8

c.

x	y
0	-9
2	-7
4	-5
6	-3
8	-1

b.

x	y
0	9
2	7
4	5
6	3
8	1

d.

x	y
-9	0
-7	2
-5	4
-3	6
-1	8

24) Which of the following tables of values represents a linear relationship?

a.

x	y
-1	-1
1	3
3	7
5	11
7	15

c.

x	y
-1	-1
1	0
3	3
5	8
7	15

b.

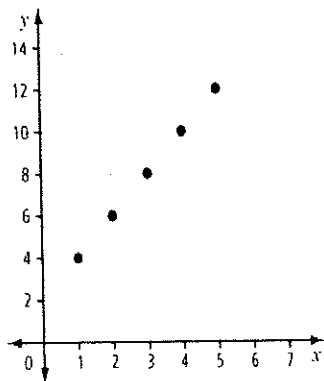
x	y
-1	1
1	1
3	9
5	25
7	49

d.

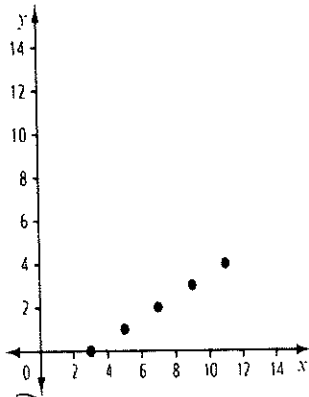
x	y
-1	-1
1	5
3	11
5	17
7	14

25) Which graph is best represented by the linear relation $y = 2x + 3$?

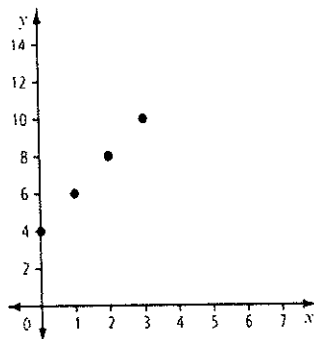
a.



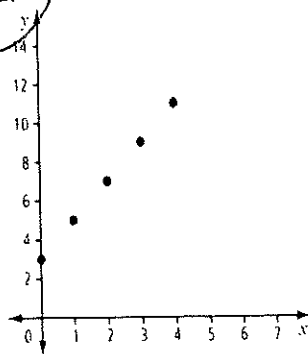
c.



b.



d.



Part 2 : Constructed Response Questions

1. a) Solve for x in each equation. Show your work.

3 marks

$\begin{array}{r} x + 2 = 8 \\ 5 \quad -2 \quad -2 \\ \hline 5x \quad \frac{x}{5} = 6 \times 5 \\ \hline x = 30 \end{array}$	$\begin{array}{r} -7x - 8 = 62 \\ \quad +8 \quad +8 \\ \hline -7x = 70 \\ \quad -7 \quad -7 \\ \hline x = -10 \end{array}$
--	--

- b) Does x have the same value in both of these equations? Justify your answer.

• No $x = 30$ in the first equation but -10 in the other.

2. To go to a concert, a group of five Grade 8 students rented a limousine. The limousine collects \$2.50 per kilometer of distance traveled and a flat fee of \$50.00.

- a) Using a variable, write an equation to calculate the cost of a trip.

•
$$C = 2.50K + 50$$

- b) If the limousine driver charged you \$95.00, how far did you travel? Please show your work.

•
$$\begin{array}{r} 2.50K + 50 = 95 \\ \quad -50 \quad -50 \\ \hline \end{array}$$

5 marks

•
$$\begin{array}{r} 2.50K = 45 \\ \hline 2.50 \quad 2.50 \\ \hline \end{array}$$

•
$$K = 18$$

- c) Each student has \$20.00. It is 25 kilometers to the concert. Do they have enough money to travel this full distance to the concert? Calculate the amount you are short or how much change you should get back. Please show your work.

•
$$20 \times 5 = \$100$$

Money they Have

•
$$2.50 \times 25 + 50 = \$112.50$$

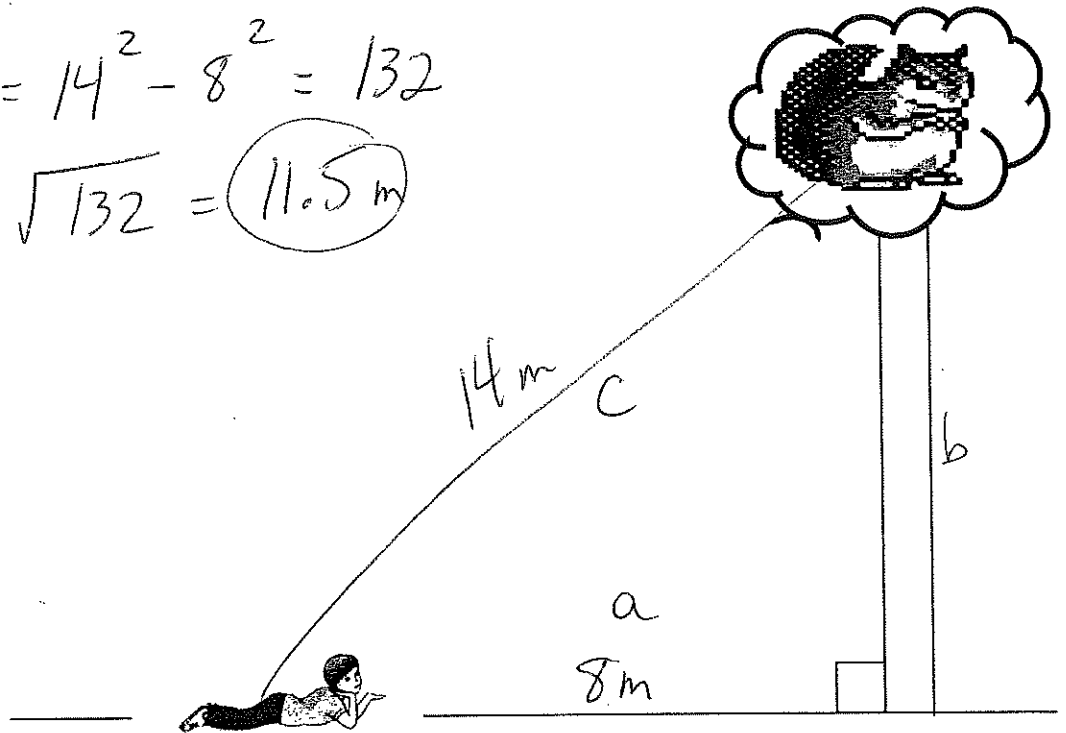
↑ Money they need

•
$$112.50 - 100 = \$12.50$$
 is the amount they are short

3. Nutty the squirrel is in a tree and is throwing acorns at you. You are lying down **8 m** from the base of the tree. The acorns travel a **diagonal** distance of **14 m** from the squirrel to you. How high up in the tree is the squirrel? Please show your work and include proper units. Note that the diagram is not to scale.

2 marks

- $b^2 = 14^2 - 8^2 = 132$
- $b = \sqrt{132} = 11.5 \text{ m}$



4. **Estimate** $\sqrt{96}$ (to the nearest tenth) and show your thinking.

2 marks

- $\sqrt{96}$ is between $\sqrt{81} = 9$ and $\sqrt{100} = 10$
- It is closer to $\sqrt{100}$ (it's a little less) so I guess 9.8

5. Place the following numbers on the number line:

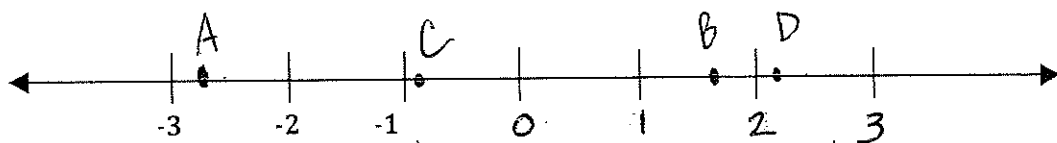
A (-2.7)

B ($1\frac{2}{3}$)

C ($-\frac{7}{8}$)

D (2.2)

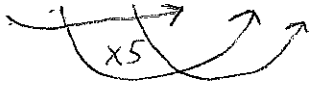
2 marks



6. Solve for X and Y.

2 marks

$$X : 12 : 20 = 20 : 60 : Y$$



$$X = \underline{4}$$
$$Y = \underline{100}$$

7. In 2003 Nutty the squirrel collected 950 acorns. He predicts that he will collect 60% more acorns this year. Please show your work.

3 marks

a) If his prediction is correct, how many acorns will he collect in 2004?

$$\bullet 950 \times 0.60 = 570$$
$$950 + 570 = \underline{1520}$$

b) If the increase in 2004 is 125% instead of 60%, how many acorns in total would Nutty collect?

$$\bullet 950 \times 1.25 = 1187.5$$
$$950 + 1187.5 = \underline{2137.5}$$

8. The regular price of jeans is \$39.99. They're on sale for 30% off.

Based on the sale price, calculate the total cost of the jeans, including GST (5%) and PST (7%). Please show your work and include proper units.

2 marks

$$\bullet \begin{cases} 39.99 \times 0.3 = \$12.00 \text{ off} \\ \$39.99 - \$12.00 = \$27.99 \text{ sale Price} \end{cases}$$
$$\bullet \$27.99 \times 1.12 = \underline{\$31.35}$$

9. A box of 24 donuts costs \$9.99. A box of 60 donuts costs \$22.99.

Determine and indicate the better buy by calculating the unit price (per donut) for each box. Please show your work and include proper units.

3 marks

$$\bullet \frac{9.99}{24} = \$0.42/\text{donut}$$
$$\bullet \frac{22.99}{60} = \$0.38/\text{donut}$$

• This is the better buy because it costs less per donut.

10. Three fifths ($\frac{3}{5}$) of the students buy hot dogs on hot dog day. There are 375 students in the school.

How many students buy hot dogs on hot dog day? Show your calculations.

$$\frac{3}{5} = 0.6 \times 375 = 225$$

2 marks

$$\frac{3}{5} \times \frac{375}{1} = \frac{1125}{5} = 225$$

11. Add the following fractions. Show all work. *Write your answer in lowest terms*

2 marks

$$\frac{3}{4} + \frac{5}{6}$$
$$\frac{9}{12} + \frac{10}{12} = \frac{19}{12} = 1\frac{7}{12}$$

12. Subtract the fractions. Show all work. *LT*

2 marks

$$4\frac{2}{3} - 1\frac{1}{5}$$
$$4\frac{10}{15} - 1\frac{3}{15} = 3\frac{7}{15}$$

13. Subtract the fractions. Show all work. *LT*

2 marks

$$6\frac{1}{2} - 1\frac{5}{6}$$
$$5\frac{6}{6} - 1\frac{5}{6} = 4\frac{1}{6} = 4\frac{2}{3}$$

14. Add the following integers.

a) $(-3) + (-7) = \underline{-10}$

2 marks

b) $(+8) + (-14) = \underline{-6}$

15. Subtract the following integers.

a) $(-4) - (-8) = \underline{+4}$

2 marks

b) $(+12) - (-3) = \underline{+15}$

16. Calculate using the order of operations.

1 mark

$5 + (-9) \times 4 \div (-1) = \underline{41}$

$5 + (-36) \div (-1)$
 $5 + (+36)$
 41

17. A freezer is at room temperature of 20 degrees Celsius. When it is turned on, the temperature inside drops by 3 degrees per hour. How long does it take the freezer to reach -16 degrees Celsius? Show your thinking.

2 marks

• $20 - (-16) = 20 + 16 = 36^\circ \text{ drop}$

• $36 \div 3 = 12 \text{ hours}$

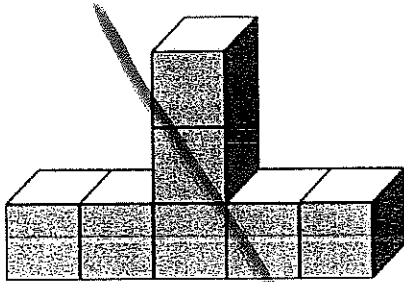
18. The gym teacher told the students to run around the perimeter of the school field 4 times. The area of the square field is 28 900 m². Calculate the distance that the students ran. Show all work.

2 marks

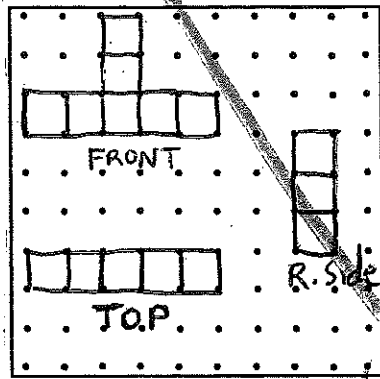
• $\sqrt{28900} = 170 \text{ m length}$

• $170 \times 16 = 2720 \text{ m}$

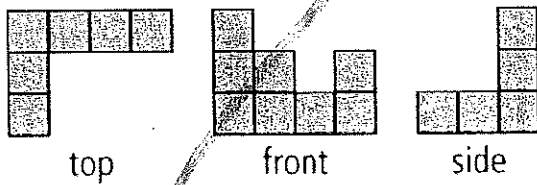
19. Draw the front, top, and right side view for this 3-D object. You may use cubes to help you.



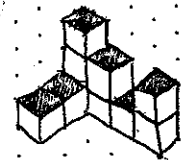
3 marks



20. Draw the 3-D object described by the three views provided below. Remember to label the front.



2 marks



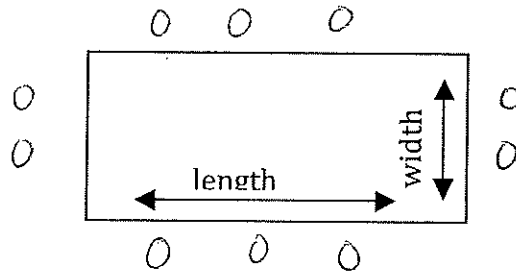
FRONT

Part 3 PROBLEMS (Patterns and Relations) _____ 10 marks

A restaurant manager has rectangular tables that seat 2 people along each width and 3 people along each length.

1. Make a sketch showing where people would sit at one table below:

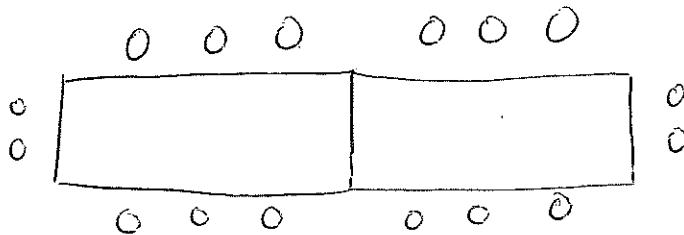
No Mark



2. The manager wants to join tables together in order to seat the maximum number of people. He's not sure if he should join them **length to length** or **width to width**.

- a) Make a sketch showing where people would sit at 2 tables joined **width to width** (short side).

1

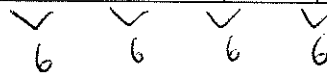


- b) Complete the table of values showing the relationship between number of tables and number of chairs if he joins them **width to width**.

Table of Values:

1

Number of tables	1	2	3	4	5
Number of chairs	10	16	22	28	34

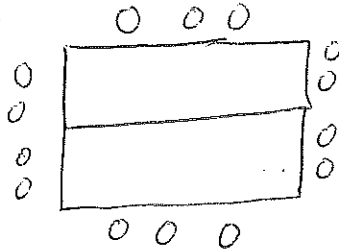


- c) Write an equation that relates the number of chairs to the number of tables, if the tables are joined **width to width**.

1

$$C = 6T + 4$$

- d) Make a sketch showing where people would sit for 2 tables joined **length to length** (long side).



- e) Complete the table of values showing the relationship between number of tables and number of chairs if he joins them **length to length**.

Table of Values:

Number of tables	1	2	3	4	5	6
Number of chairs	10	14	18	22	26	30

\checkmark 4 \checkmark 4 \checkmark 4 \checkmark 4

- f) Write an equation that relates the number of chairs to the number of tables, if the tables are joined **length to length**.

$$C = 4T + 6$$

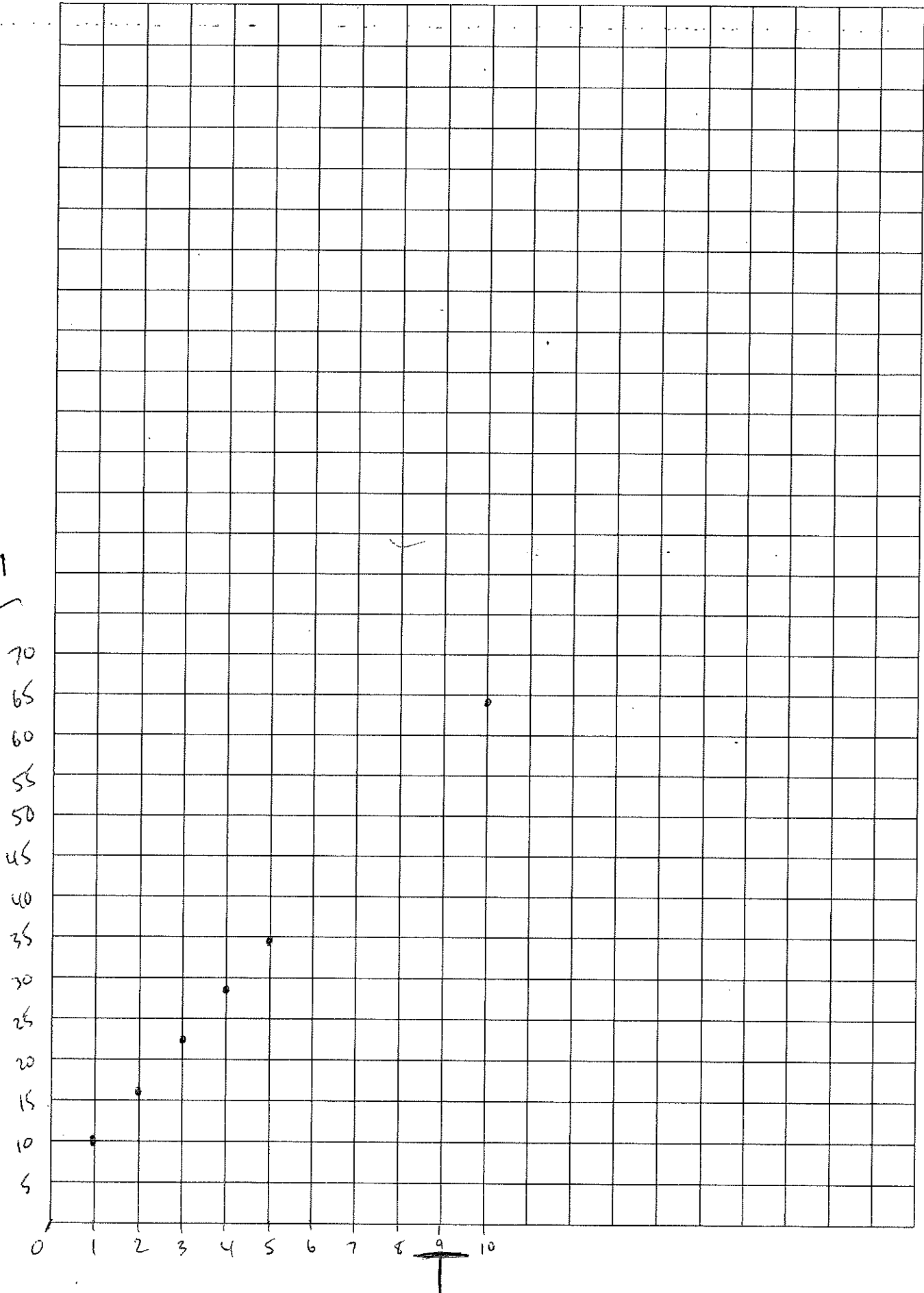
3. Which arrangement will seat the most number of people? Justify your answer.

Width to Width will seat 34 people when 5 tables are placed side by side. but only 26 people when they are length to length

4. Use the graph paper on the next page to create a **labeled** graph representing the table of values for the seating arrangement that seats the most people.

RESTAURANT SEATING

C



5. The restaurant manager is having a party and wants to seat the most people possible. Using your equation, calculate the maximum number of people that can be seated at 10 tables joined together.

1

$$C = 6 \times 10 + 4 = 64 \text{ people}$$

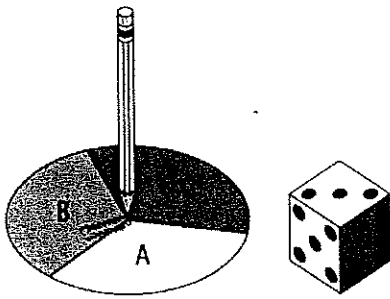
6. Verify your answer by plotting this point on your graph. ✓

(NO MARK)

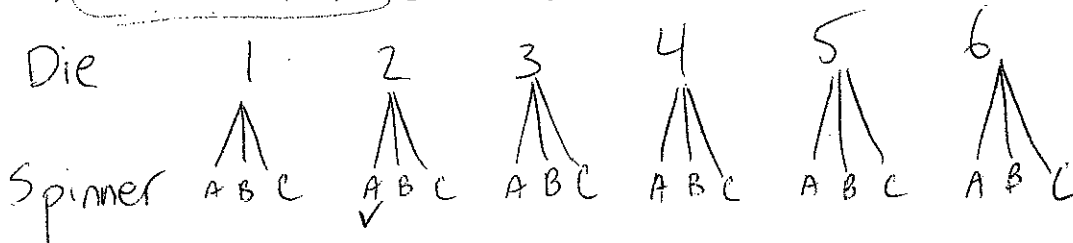
Part 3 : PROBLEMS (Probability)

_____ / 8 marks

- 1) Pedro spins the spinner below and rolls a standard die.



- a) Calculate the P. (A,2) using a tree diagram.



$$P.(A,2) = \frac{1}{18}$$

- b) Calculate the P. (B, odd number) using multiplication of fractions.

2

$$\frac{1}{3} \times \frac{3}{6} = \frac{1}{6}$$

3R
2B 6

2P
4D 7

2) A bag contains 3 red marbles and 2 black marbles. A second bag contains 2 pennies and 4 dimes. Vinny will select one item from each bag without looking.

a) Calculate the P. (Red, Penny) using a table.

BAG OF COINS

2

BAG OF Marbles

	P	P	D	D	D	D
R	RP	RP	RD	RD	RD	RD
R	RP	RP	RD	RD	RD	RD
R	RP	RP	RD	RD	RD	RD
B	BP	BP	BD	BD	BD	BD
B	BP	BP	BD	BD	BD	BD

$$P(R, P) = \frac{6}{30} = \frac{1}{5}$$

b) Calculate the P. (Black, Dime) using multiplication of fractions.

2

$$\frac{2}{5} \times \frac{4}{6} = \frac{8}{30} = \frac{4}{15}$$

This is the End of the ESMS Grade 8 Math Exam