



BRITISH
COLUMBIA

Essentials of Mathematics 10

June 2004 Examination

(Updated as of January 2005)

Student Instructions

1. Ensure that in addition to this **Student Booklet**, you have a **Data Booklet** and a **Response Form**.
2. **Disqualification** from the examination will result if you bring books, paper, notes, or unauthorized electronic devices into the examination room.
3. This examination is designed to be completed in **two hours**. *Students may, however, take up to 30 minutes of additional time to finish.*
4. At the end of the examination, return this **Student Booklet**, the **Data Booklet** and the **Response Form** to the supervisor.

ESSENTIALS OF MATHEMATICS 10 PROVINCIAL EXAMINATION

INSTRUCTIONS

1. All answers must be entered on the Response Form using an **HB pencil**. Answers entered in this examination booklet will **not** be marked.
2. A **Data Booklet** is provided. It contains bank account information, a sales taxes in Canada map, partial tables for CPP, EI, Provincial and Federal tax, a table of conversions, the three basic trigonometric ratios, area formulae, and surface area and volume formulae. *Rough Work for Graphing* and *Rough Work Space* are located at the back of the examination.
3. Use the value of π programmed in your calculator rather than the approximation of 3.14.
4. When using the calculator, rounding should occur **only in the final step** of the solution.
5. The provincial examination consists of 60 questions worth one mark each. There are **four** types of questions:
 - 4 True-and-False Questions
 - 12 Matching Questions
 - 8 Numerical-Response Questions
 - 36 Multiple-Choice Questions**60 Total**
6. When answering **Numerical-Response** questions, please note the following:

- Find the correct question number on the Response Form and write your answer in the spaces provided, noting proper place value. **Only one digit per box.**
- PRINT your digits **as shown below**. Keep within the box provided.

0	1	2	3	4	5	6	7	8	9
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- Negative answers must include a shaded negative circle. If neither circle is bubbled, the answer will be read as positive.
- Leave unused boxes blank.
- For example, the answer **-70.6** will be written as shown.

+	-		7	0	.	6	
<input type="radio"/>	<input checked="" type="radio"/>						

1. What does ATM stand for?
 - A. Automated Teller Machine
 - B. Automatic Terminal Machine
 - C. Automatic Teller Mechanism
 - D. Automated Transaction Mechanism

2. John made the following transactions:

June 10	ATM Withdrawal	\$50.00
June 12	Deposit	\$80.60
June 15	Cheque	\$25.12
June 20	ATM Withdrawal	\$75.00

His balance on June 9 was \$165.12. He is charged \$0.50 for each ATM withdrawal and \$0.75 for each cheque. What is his current balance?

- A. \$15.60
- B. \$93.85
- C. \$95.60
- D. \$144.09

3. Ryan has a savings account with a balance of \$336.55. During the month, he made the following debit transactions: \$50, \$20, \$30, \$40 and the following credit transaction of \$100. What is the closing balance in his pass book?

Transaction Record: Chequing Account 412-783-27						
Cheque #	Date	Description	Payment /Debit	✓	Deposit /Credit	Balance 336.55
			50.00			
			20.00			
			30.00			
			40.00			
					100.00	

- A. \$196.55
- B. \$240.00
- C. \$296.55
- D. \$376.55

4. At what number of transactions would account B's charges equal account A's charges?

Account	A	B
Service charge	\$11.95	\$6.95
Cost per transaction	unlimited	\$0.50 per transaction

Record your answer neatly on the Response Form.

Use the following transaction record to answer questions 5 to 7.

Transaction Record: Chequing Account 412-783-27				John Walton		
Cheque #	Date	Description	Payment /Debit	✓	Deposit /Credit	Balance
						254.00
WWW	13/06	Transfer from savings (#54321)			50.00	304.00
WWW	13/06	Telus Mobility (54322)	44.11			259.89
ATM DEP	15/06	Deposit			120.00	379.89
TEL	17/06	Telus ADSL (#54323)	34.99			344.90
ATM DEP	21/07	Deposit			100.00	444.90
TEL	23/08	Shaw Cable (#54324)	56.54			388.36
WWW	24/08	Terasen (#54325)	63.56			324.80
DEP	28/08	Deposit			130.00	454.80

Match each Question on the left with the correct Answer on the right.
Each Answer may be used once, more than once or not at all.


Question	Answer
5. What is the total payment John made over the Internet in June?	A. \$400.00 B. \$100.00
6. What is the total payment John made by telephone in August?	C. \$91.53 D. \$56.54
7. What is the total deposit to John's chequing account in July?	E. \$107.67 F. \$44.11

Use the following charts to answer question 8.

Statement of Account		Branch No. 100		Account Number 9234567k	
Statement Date:		Jan 22, 2004		Account Type: Self-Serve	
Description	Withdrawals	Deposits	Date	Balance	
Balance Forward			Jan. 1/04	1045.56	
Cheque #83	79.36		Jan. 8/04	966.20	
Cheque #84	47.39		Jan. 9/04	918.81	
Deposit		456.48	Jan. 15/04	1375.29	
ATM	80.00		Jan. 16/04	1295.29	
Cheque #86	148.51		Jan. 21/04	1146.78	
Cheque #85	300.00		Jan. 21/04	846.78	
Service Charge	6.95		Jan. 22/04	839.83	

Transaction Record						
Cheque #	Date	Description	Payment/ Debit	✓	Deposit/ Credit	Balance \$ 1045.56
83	Jan .6/04	Best Foods	79.36			966.20
84	Jan .7/04	Insurance	47.39			918.81
DEP	Jan .15/04	Pay - Garage			456.48	1375.29
85	Jan .15/04	Rent	300.00			1075.29
CASH	Jan .16/04	Movie/Dinner	80.00			995.29
86	Jan .20/04	Visa Bill	148.51			846.78
DEP	Jan .23/04	Tutoring Pay			200.00	1046.78
87	Jan .27/04	Best Foods	42.93			1003.85

8. Use the form below to reconcile the transaction record and statement of account on the previous page.

 BANK OF EVERMORE Blue Harbour, B.C.		Statement of Reconciliation	
Bank Statement		Transaction Record	
FINAL BALANCE shown on this statement		FINAL BALANCE shown on transaction record	
ADD DEPOSITS made after the statement date		SUBTRACT WITHDRAWALS which are not shown on transaction record	
SUBTOTAL \$			
SUBTRACT WITHDRAWALS made after the statement date			
FINAL BALANCE \$		FINAL BALANCE \$	

What is the final balance?

- A. \$839.63
 - B. \$846.78
 - C. \$996.90
 - D. \$1003.85
9. What does EI stand for?
- A. Emergency Income
 - B. Employment Insurance
 - C. Emergency Insurance
 - D. Employment Income

10. Sheila's bank balance is \$75.50. She needs to pay her \$75.36 credit card bill, \$40.00 phone bill, and dinner bill for \$10.79. What is the **minimum** amount of money she needs to deposit into her bank account?
- A. \$29.35
 - B. \$50.65
 - C. \$50.93
 - D. \$126.15
11. Ben can take a salary increase of 5.5% every six months or 11.2% every year. After one year his salary will be greater with the 5.5% every six months.
- A. Statement is always true.
 - B. Statement is sometimes true.
 - C. Statement is never true.
12. Job A pays \$318 per week. Job B pays \$314.50 per week. Assuming 52 weeks of employment, what is the difference between the two monthly salaries? (Answer in dollars and cents.)

Record your answer neatly on the Response Form.

13. A family's annual net income is \$41 720.00. They spend 4% of this amount each year eating at restaurants. Which of the following best shows the average amount they spend each month in restaurants?
- A. \$140
 - B. \$170
 - C. \$1390
 - D. \$1670

14. Sue is paid an hourly wage of \$9.00 for a 40-hour week and time-and-a-half for overtime. What is her pay, before any deductions, for one week during which she worked 46 h?
- A. \$360.00
 - B. \$414.00
 - C. \$441.00
 - D. \$474.00

15. In which year will Job A pay more than Job B?

Job A	Job B
\$900/month	\$1200/month
18% raise after each year	10% raise after each year

- A. 3rd
 - B. 4th
 - C. 5th
 - D. 6th
16. Which of the following is the **least** effective use of a spreadsheet when operating a small business?
- A. budget
 - B. hockey pool
 - C. inventory
 - D. payroll

17. What value would be inserted into cell C3?

	A	B	C	D
1	Quantity	Unit Price	Cost	
2	4	\$3.79		
3	3	\$4.19		
4			Total:	

- A. \$0.95
- B. \$1.40
- C. \$12.57
- D. \$15.16

18. Which formula would be inserted into cell E2?

	A	B	C	D	E
1	EI	CPP	Provincial Tax	Federal Tax	Total Deductions
2	89.00	72.15	141.39	256.27	
3					

- A. = A2 + C2 + D2
- B. = A2 + B2 + C2
- C. = SUM (A2 :D2)
- D. = AVERAGE (A2 :D2)

19. The formula for cell E5 is $= 1.5 * C5$. The formula for cell F5 is $= B5 * C5 + D5 * E5$.
What is Serena's gross pay? (Answer in dollars and cents.)

	A	B	C	D	E	F
1	Name	Regular Hours	Regular Pay Rate (\$)	Overtime Hours	Overtime Pay Rate (\$)	Gross Pay (\$)
2	Jimmy	40	8.00	7		
3	Sean	40	7.50	5		
4	Angie	40	9.00	12		
5	Serena	40	9.60	8		

Record your answer neatly on the Response Form.

20. What is the **most** efficient way to insert \$9.10 into cells C2, C3, C4, C5 and C6?

	A	B	C	D
1	Name	Hours Worked	Pay/h	Gross Pay
2	Kia	18	\$9.10	\$163.80
3	Annette	23	\$9.10	\$209.30
4	Nicole	27.5	\$9.10	\$250.25
5	Julia	29	\$9.10	
6	Cassie	31	\$9.10	

- A. Use the fill command.
- B. Re-type \$9.10 in each cell.
- C. Use the formula $= B2 * C2$.
- D. Use the copy/paste functions.

Use the following spreadsheet to answer question 21.

	A	B	C	D	E	F
1	Name	Regular Hours	Regular Pay Rate (\$)	Overtime Hours	Overtime Rate	Gross Pay (\$)
2	Ryan					
3	Craig					
4	Todd	31	9.50	6.5		418
5	Brad					

21. If the value of cell F4 is 418 then the value of cell E4 is 1.5.

- A. The statement is always true.
- B. The statement is sometimes true.
- C. The statement is never true.

22. Solve the proportion $\frac{r}{27} = \frac{36}{12}$

- A. 9
- B. 12
- C. 56
- D. 81

23. If \$1.00 Canadian costs 70 cents US, how many US dollars will \$15.00 Cdn purchase?

- A. \$10.50
- B. \$14.30
- C. \$15.70
- D. \$21.43

Match each Question on the left with the correct Response on the right.
Each Response may be used once, more than once or not at all.

Question	Response
<p>Jeremy lives in Montreal, QC. He buys a computer regularly priced at \$1570. He receives an employee discount of 25%.</p> <p>24. What is the discount?</p> <p>25. What is the sale price?</p> <p>26. What is the total price including taxes?</p>	<p>A. \$39.25</p> <p>B. \$392.50</p> <p>C. \$1348.24</p> <p>D. \$1177.50</p> <p>E. \$1530.75</p> <p>F. \$1342.35</p> <p>G. \$449.41</p> <p>H. \$1752.71</p>

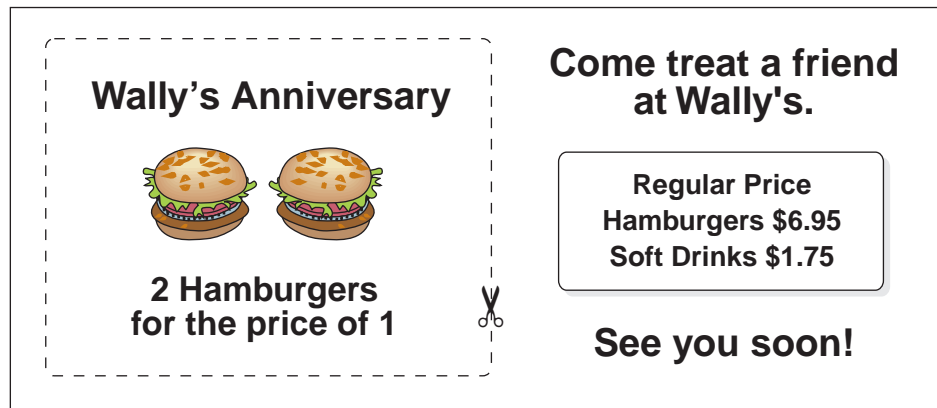
**REFER TO
DATA BOOKLET**

Use Sales Tax Information in the Data Booklet to answer question 27.

27. Emile, who lives in Quebec, purchased a DVD player for \$218. His cousin, who lives in PEI, bought the same DVD player at the same price. When taxes are added, how much less did Emile pay than his cousin? (Answer in dollars and cents.)

Record your answer neatly on the Response Form.

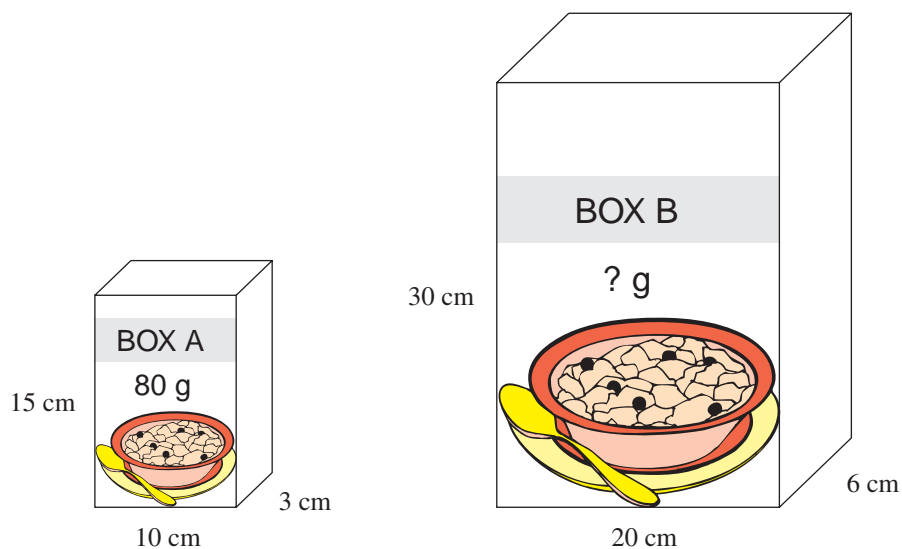
28. To celebrate the restaurant's 5th anniversary, Wally advertised 2-for-1 coupons in the newspaper.



Five friends each have a hamburger and a soft drink. They use 2 coupons and leave an \$8 tip. Tax is 7% on all meals. To the nearest dollar, what amount should each person pay if they share the cost equally?

- A. \$5
- B. \$6
- C. \$7
- D. \$8

29. Cereal for the restaurant can be bought in two sizes of similar shape. Box A holds 80 g of cereal. How many grams of the same cereal should Box B hold?



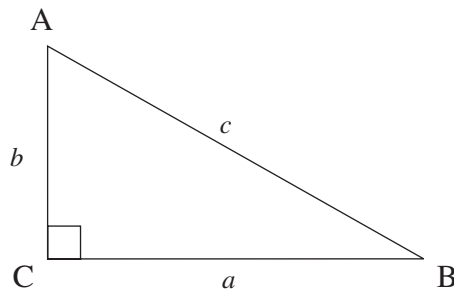
- A. 640
- B. 480
- C. 320
- D. 160

30. What is the least expensive rate per 100 mg of Vitamin C?

Bottle 1	Bottle 2
100 pills (1000 mg capsules)	250 pills (500 mg capsules)
350 mg of vitamin C per 1000 mg capsule	150 mg of vitamin C per 500 mg capsule
\$23.99 per bottle	\$32.99 per bottle

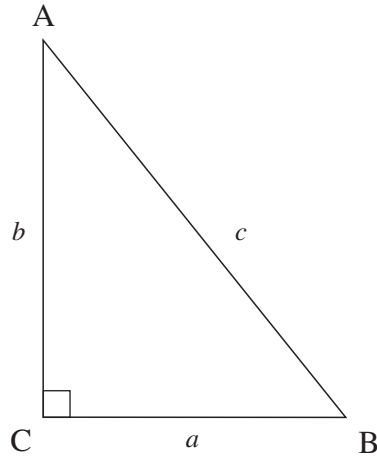
- A. \$0.06
- B. \$0.07
- C. \$0.08
- D. \$0.09

31. Side b is adjacent to $\angle A$ in the figure below.



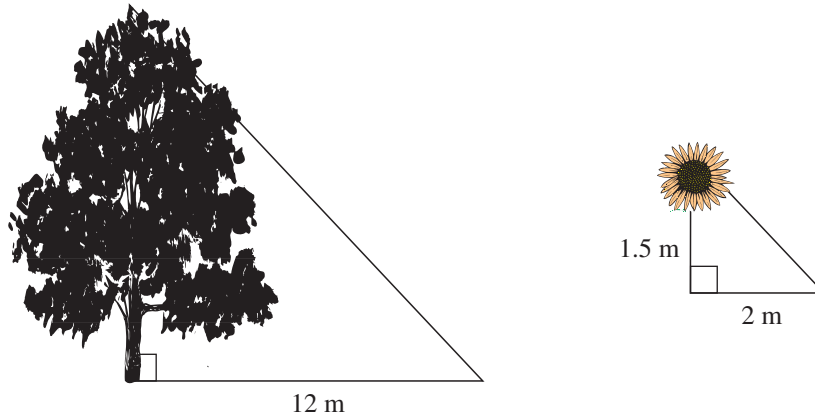
- A. True
- B. False

32. Given right triangle ABC with $a = 4$, $b = 5$, $c = 6.403$, calculate $\tan A$.



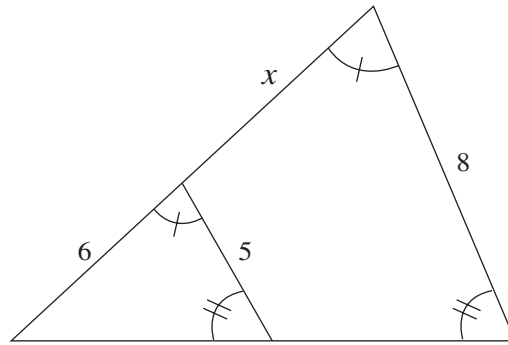
- A. 0.8
- B. 1.25
- C. 38.6
- D. 51.3

33. The length of a shadow cast by a maple tree is 12 m. At the same time, the length of a shadow cast by a 1.5 m sunflower plant is 2 m. How tall is the tree?



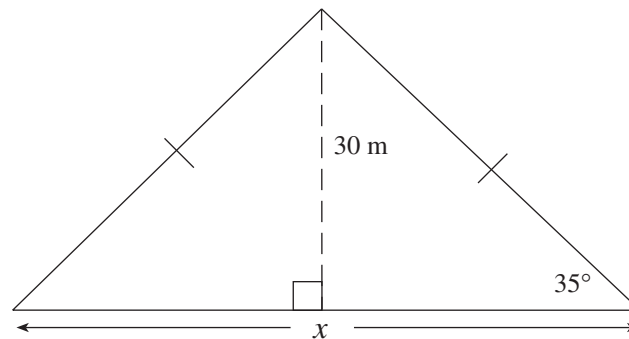
- A. 8 m
- B. 9 m
- C. 10 m
- D. 12 m

34. Find the value of x . (Answer to one decimal place.)



Record your answer neatly on the Response Form.

35. What is the length of the base? (Round to the nearest metre.)



- A. 37
- B. 43
- C. 52
- D. 86

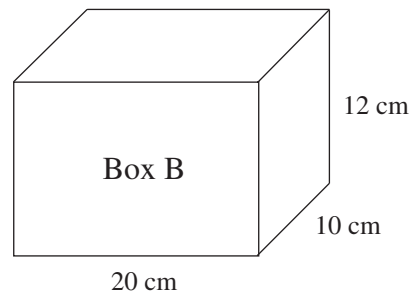
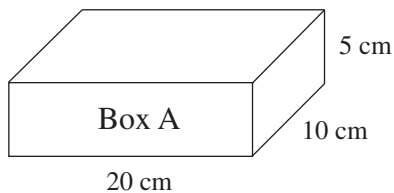
36. Two trees are 50 feet apart. Nikki is standing between the trees, 25 feet from each tree. She notes that the angle of elevation to the top of one tree is 20° and to the other is 30° . What is the difference in the height of the trees?

- A. 1.8 feet
- B. 3.9 feet
- C. 5.3 feet
- D. 9.1 feet

37. Which of the following units can area be measured in?

- A. km, miles
- B. cm, inches
- C. cm^2 , inch^2
- D. cm^3 , inch^3

38. Facial tissue is sold in two different sizes. Box A contains 60 tissues. How many facial tissues does Box B contain?



- A. 720
- B. 480
- C. 420
- D. 144

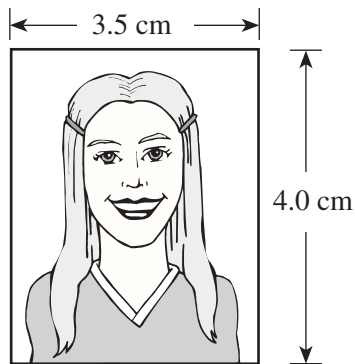
**Match the Unit Measure on the left with the Object on the right.
Each Object may be used once, more than once or not at all.**

Unit Measure	Object
39. m	A. Carpet
40. m ²	B. Baseboard moulding
41. m ³	C. Pencil
	D. Breathable air
	E. One floor tile
	F. Water in a glass

42. The circumference of a soccer ball is 95 cm. Given that $C = 2\pi r$, what is its radius in centimetres? (Answer to one decimal place.)

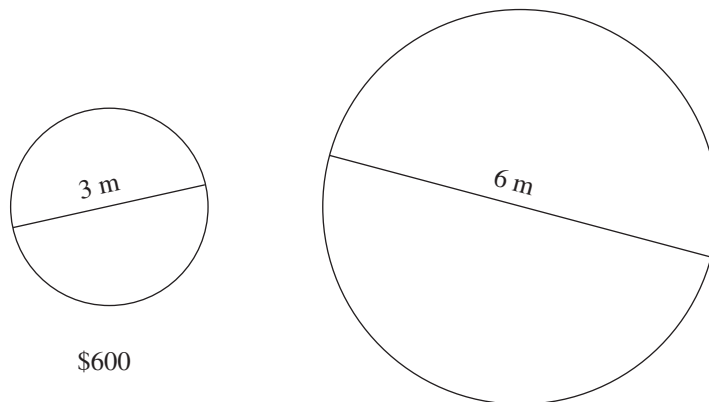
Record your answer neatly on the Response Form.

43. The Yearbook Club decides to cut costs for the yearbook by reducing the picture size of personal photos. The original pictures have dimensions of 3.5 cm by 4.0 cm.



If **each dimension is reduced** by 15%, what is the area of the final reduced photo, to the nearest tenth?

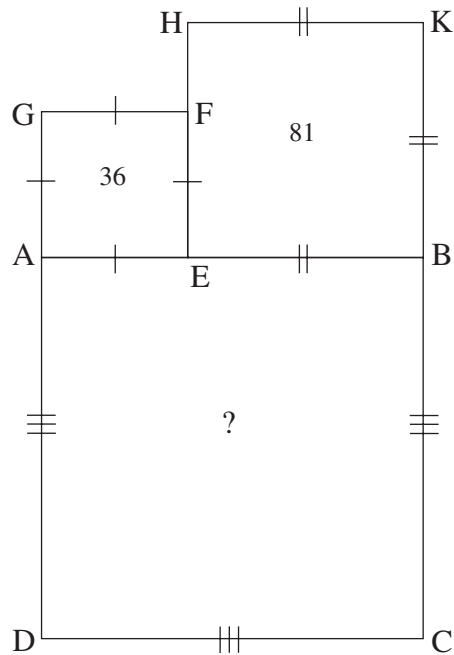
- A. 10.1 cm^2
B. 11.1 cm^2
C. 11.9 cm^2
D. 14.0 cm^2
44. Wally is considering buying a rug for his restaurant. It costs \$600 for a circular rug that is 3 m in diameter.



If cost is based on area, what would it cost for a circular rug that is 6 m in diameter?

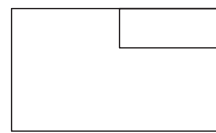
- A. \$1200.00
B. \$2400.00
C. \$3600.00
D. \$4800.00

45. If the area of HEBK is 81 and the area of GAEF is 36, what is the area of square ABCD?

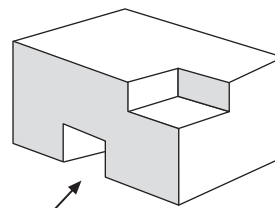


- A. 289
- B. 256
- C. 225
- D. 144

46. The Front View matches the 3-D diagram.



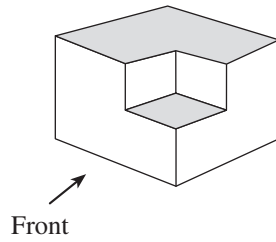
Front View



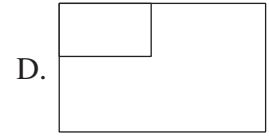
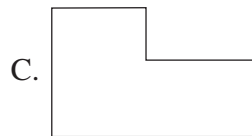
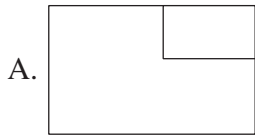
3-D Diagram

- A. True
- B. False

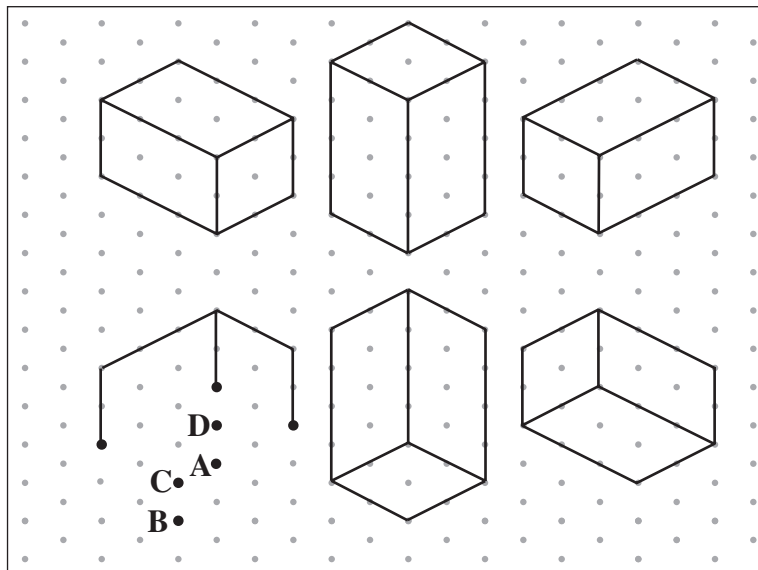
47. Consider the following 3-D diagram.



Which of the following views matches the front view of the 3-D diagram above?



48. Five out of six representations of a box are completed using isometric dot paper. Which lettered dot is the corner that completes the final representation?



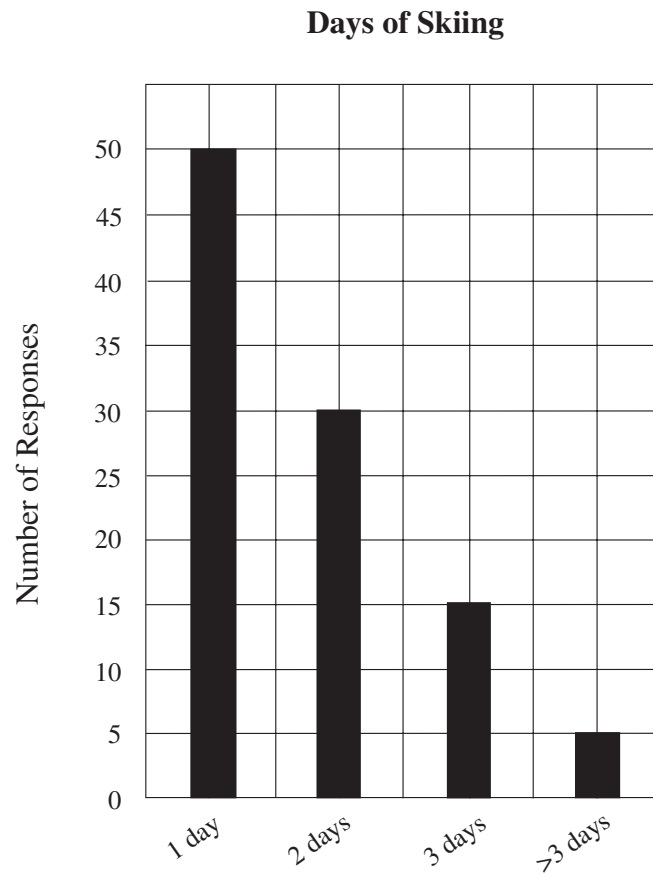
- A. Letter A
- B. Letter B
- C. Letter C
- D. Letter D

49. What is the probability of rolling an even number on a regular die? (Answer in decimal form to one decimal place.)

Record your answer neatly on the Response Form.

Match each Description on the left with the correct Term on the right. Each Term may be used once, more than once or not at all.	
Description	Term
50. a small part of the total	A. population
51. total collection	B. systematic
52. a method of sampling	C. sample
	D. data
	E. probability
	F. quadrant method

53. On a particular ski trip, people were asked how many days they planned to ski. How many people responded to the survey?



- A. 200
B. 100
C. 60
D. 50
54. Which of the following is **not** a method of selecting a sample to represent a larger population?
- A. Survey
B. Cluster
C. Systematic
D. Stratified random

55. Which of the following issues should be considered when collecting data?

I.	Appropriate Language
II.	Ethics
III.	Cost
IV.	Cultural Sensitivity

- A. I, II, III
- B. I, II, IV
- C. II, III, IV
- D. I, II, III, IV

56. Wally counted the types of vehicles in the restaurant's parking lot.

Vehicles	Number
Volkswagen	32
Ford	25
Toyota	15
G.M.	10
Honda	38

What is the probability that the next vehicle leaving the lot will be a Toyota?

- A. $\frac{1}{5}$
- B. $\frac{1}{6}$
- C. $\frac{1}{7}$
- D. $\frac{1}{8}$

57. On a thirteen item true/false quiz the average score was 9. What was the total number of correct responses from the class of 24 students?

Record your answer neatly on the Response Form.

58. The following data was collected in response to the question:

What is your favourite Canadian NHL team?		
Canucks 24	Senators 15	Canadiens 9
Maple Leafs 19	Flames 12	Oilers 7

For a circle graph to display this data, how large is the angle representing Canuck responses?

- A. 24
- B. 28
- C. 86
- D. 100

59. The restaurant's average profit over a five-day period was \$254.55. In the first four days, the profits were \$238.75, \$272.50, \$189.00 and \$308.25. What was the profit made on the fifth day?

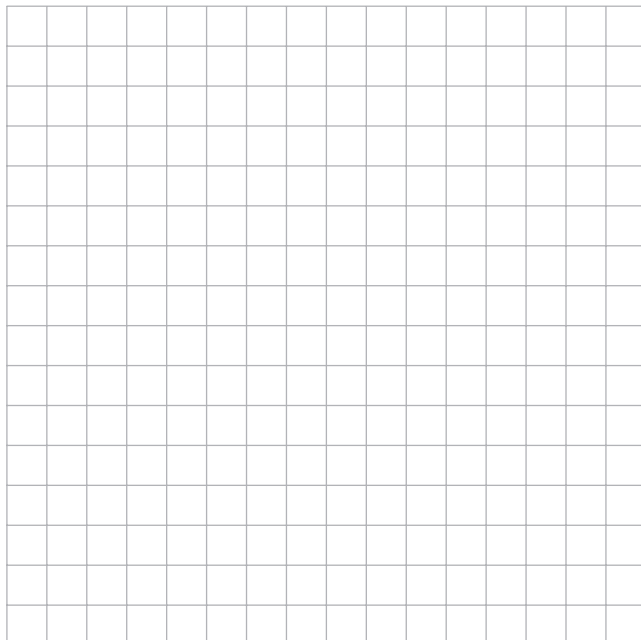
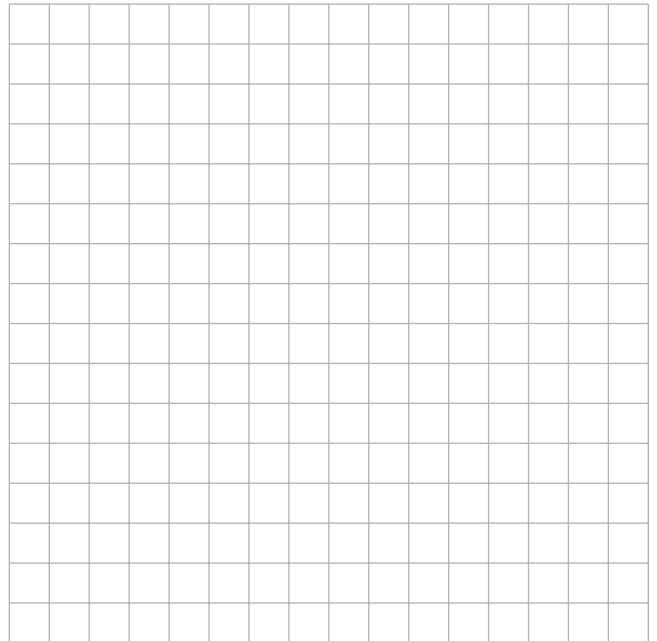
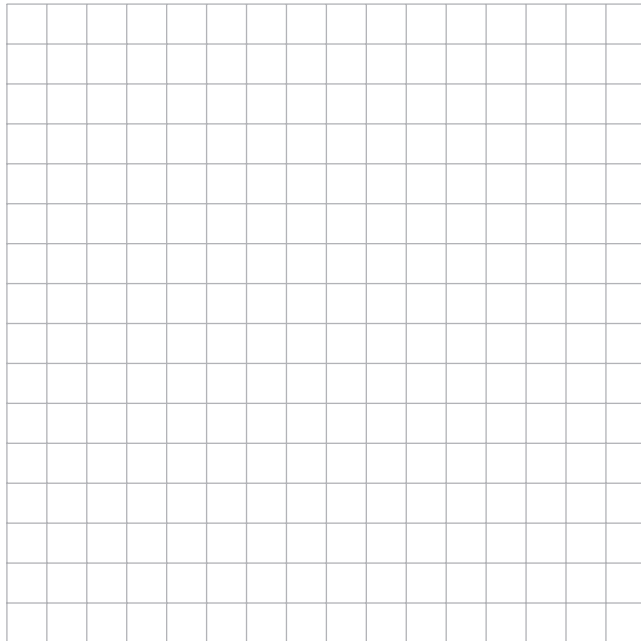
- A. \$252.13
- B. \$252.61
- C. \$253.34
- D. \$264.25

60. The names of 45 Grade 10 students were recorded. The next day, 49 Grade 10 students' names were recorded in the same area at the same time. Twenty-five of these students had also been present the day before. Based on this data, which best estimates the total population of Grade 10 students? (Answer to the nearest whole number.)

- A. 119
- B. 94
- C. 88
- D. 69

END OF EXAMINATION

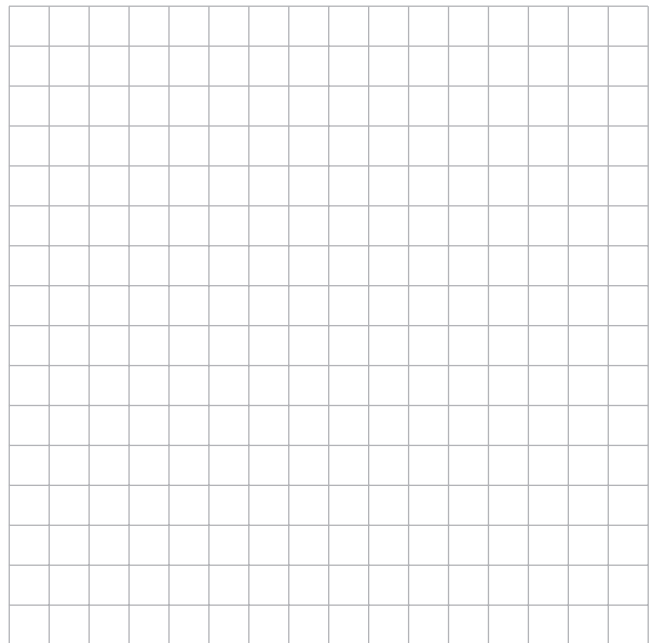
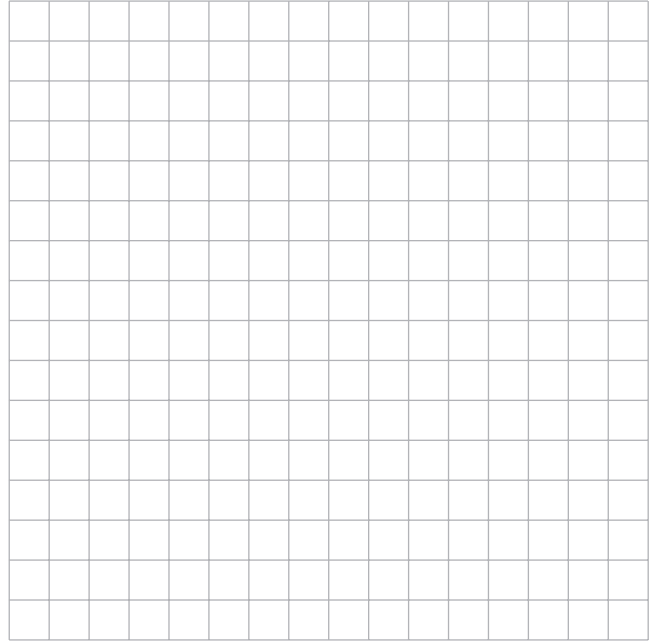
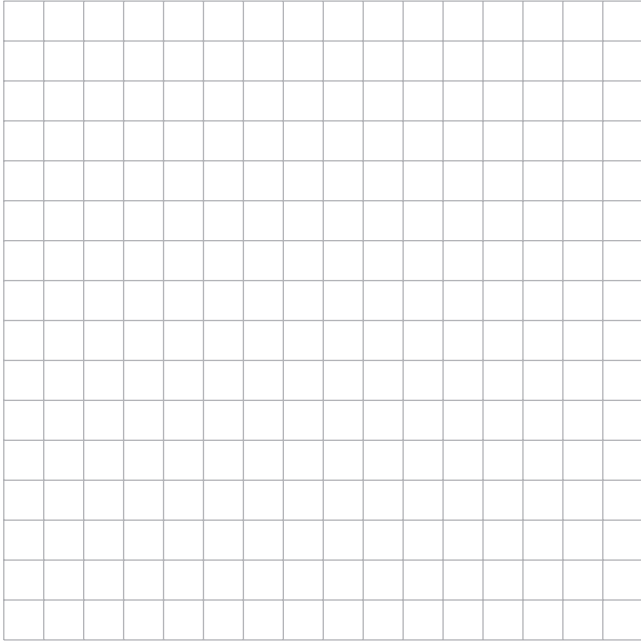
ROUGH WORK FOR GRAPHING
(No marks will be given for work done on this page.)



You may detach this page for convenient reference.
Exercise care when tearing along perforations.

ROUGH WORK FOR GRAPHING

(No marks will be given for work done on this page.)



ROUGH WORK SPACE

**You may detach this page for convenient reference.
Exercise care when tearing along perforations.**

ROUGH WORK SPACE