



BRITISH
COLUMBIA

Essentials of Mathematics 10

Sample 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
 - 8 Numerical-Response Questions
 - 12 Matching 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. Which account would Jack’s father have chosen 17 years ago to regularly put aside money for Jack’s university or post-secondary education?
 - A. Value account
 - B. Savings account
 - C. Full-serve account
 - D. Self-serve account

Use the following information to answer question 2.

Option A:	\$4.95 per month; \$0.50 per self-serve transaction, including withdrawals and deposits \$0.50 per full-serve transaction
Option B:	\$10.95 per month; unlimited self-serve transactions; \$1.00 per full-serve transaction

2. Hinbi is shopping for a new bank account. She will be making 4 bank machine deposits per month, 2 full-serve transactions per month plus 8 withdrawals at an ATM per month. Which option is less expensive, and by how much?
 - A. Option A; \$1.00 less expensive
 - B. Option B; \$1.00 less expensive
 - C. Option A; \$6.00 less expensive
 - D. Both are equal

Use the following tables to answer question 3.

 Blue Harbour, B.C. Statement of Account				
Balance Forward	Withdrawal	Deposit	Date	Balance
				100.01
Deposit		500.00	01/06	600.01
Cheque 17	43.17		02/06	556.84
Cheque 18	36.21		03/06	520.63
Service charge	10.00		03/06	510.63

Transaction Record					
Cheque #	Date	Description	Payment/ Debit	Deposit/ Credit	Balance
					100.01
<i>Deposit</i>	<i>June 1</i>	<i>Pay</i>		500.00	600.01
<i>Cheque 17</i>	<i>June 1</i>	<i>BC Hydro</i>	43.71		556.30
<i>Cheque 18</i>	<i>June 1</i>	<i>Telus</i>	36.21		520.09
<i>Cheque 19</i>	<i>June 1</i>	<i>Rent</i>	400.00		120.09

3. Given the statement of account and the transaction record, which **best** explains why they do not balance?

I.	Service charge
II.	Cheque not recorded
III.	Personal recording error
IV.	Cheque has not cleared the bank

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

Use the following transaction record to answer question 4.

Transaction Record						
Cheque #	Date	Description	Payment/ Debit	✓	Deposit/ Credit	Balance \$600.54

Bring Carlee's transaction record book up to date by entering the following information.

Carlee writes cheque #204 on July 16, 2003 for \$54.62.
Carlee deposits a cheque for \$256.32, two \$10.00 bills, and ten \$2.00 coins into her account on July 17, 2003.

4. What is Carlee's final balance?

Record your answer neatly on the Response Form.

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

Term	Definition
5. Overdrawn	A. Used to take money out of your account
6. Reconcile	B. In certain circumstances a bank will not collect (or charge) a service fee
7. Waive	C. To process quickly a transaction at a teller
	D. Used as photo identification
	E. To draw beyond the space provided on a cheque
	F. To make one account record consistent with another
	G. To take out more money than is in your account

8. Winona works 7 h and 45 min. Expressed as a decimal, how many hours did she work?

- A. 7.45
- B. 7.55
- C. 7.65
- D. 7.75

9. Todd worked from 10:12 a.m. to 4:35 p.m. What is the time he worked in hours expressed to two decimal places?

- A. 5.77
- B. 6.23
- C. 6.38
- D. 6.78

10. Mary earns \$8.50 per hour and works 40 h per week. Place the following in order from **least to greatest**. Use claim code 1.

Employment Insurance	(EI)
Canada Pension Plan	(CPP)
Provincial Tax	(BC)
Federal Tax	(FED)

- A. BC, FED, EI, CPP
- B. EI, CPP, FED, BC
- C. EI, BC, CPP, FED
- D. FED, CPP, BC, EI

Shade in Bubble A if the statement is always true.
Shade in Bubble B if the statement is sometimes true.
Shade in Bubble C if the statement is never true.

Question

11. A salary is the same whether paid biweekly or bimonthly.

12. A clerk works a regular 7.5-hour day and is paid \$10.00 per hour. She is paid time-and-a-half if she works more than 7.5 h/d, and time-and-a-half for Saturdays. She earns double time if she works Sundays and holidays. Her hours for last week are shown below. What is her gross pay? (Answer in dollars and cents.)

Monday	7.5
Tuesday	7.5
Wednesday	8.5
Thursday	9
Friday	7.5
Saturday	3
Sunday	2.5

Record your answer neatly on the Response Form.

13. Kelly's family takes \$500 on their holiday. They budget $\frac{1}{4}$ of it for entertainment, $\frac{1}{8}$ of it for gasoline and $\frac{2}{5}$ of it for food. **About** how much money would be left for other things?
- A. \$100
 - B. \$115
 - C. \$325
 - D. \$400

14. Kelly earns \$340.00 per week. What will be the net amount of Kelly's pay cheque after her EI, CPP, and Federal and Provincial tax deductions? Use claim code 1.
- A. \$249.01
 - B. \$258.66
 - C. \$272.86
 - D. \$282.51

15. The pastry chef at the restaurant earns \$804.00 every 2 weeks. If he works a regular 40-hour week, what is his hourly wage?
- \$8.10
 - \$10.05
 - \$10.50
 - \$20.10
16. A technician charged Wally \$74.20 for parts and \$28/h for labour to repair his cash register. A tax of 7% is charged on both parts and labour, and an additional 7% tax is applied only to parts. It took 2.5 h to repair the register. Which amount **best** shows the approximate total repair bill?
- \$164.00
 - \$159.00
 - \$154.00
 - \$144.00
17. To identify a particular cell location in a spreadsheet, which one of the following is used?
- two letters
 - two numbers
 - column then row
 - row then column

Use the following information to answer question 18.

	A	B	C
1	Hours	Rate	Pay
2	8	8.50	
3			
4			

18. Which formula would be inserted into cell C2?
- = A1 + B1
 - = A1 * B1
 - = A2 + B2
 - = A2 * B2

Use the following spreadsheet to answer questions 19 and 20.

	A	B	C	D	E
1	Name	Assignments	Project	Tests	Final Mark
2		120	80	60	= B2 + C2 + D2
3	Crystal	88	75	31	= (B3 + C3 + D3) / E2 * 100
4	David	72	58	39	
5	Erin	103	64	48	
6					
7					
8	Class Average				= AVERAGE (E3:E5)

19. What number will be produced by the formula entered in E3? (Round to a whole number.)

Record your answer neatly on the Response Form.

20. Cells E4 and E5 contain similar formulas to E3. What is the value in E8?

- A. 74
- B. 75
- C. 78
- D. 79

21. GST stands for Government Services Tax.

- A. True
- B. False

22. Supplies for making 50 candles cost \$100 for wax, \$5 for wicks, \$15 for colours/dyes, \$50 for scents and \$150 for promotion. How much should be charged per candle to make a \$100 profit?
- A. \$2.00
 - B. \$4.20
 - C. \$5.20
 - D. \$8.40

23. A recipe calls for $4\frac{1}{2}$ cups of flour to $\frac{2}{3}$ cups of sugar. How many cups of sugar would you use with $2\frac{1}{4}$ cups of flour?

- A. $\frac{1}{6}$
- B. $\frac{1}{3}$
- C. $1\frac{1}{3}$
- D. $2\frac{11}{12}$

**Match each Word Problem on the left with the correct Formula on the right.
Each Formula may be used once, more than once or not at all.**

Word Problem	Formula
24. Add cells G7 and H2	A. $= 0.075 * C6$
25. Multiply cell C6 by 7.5%	B. $= G7/H2$
26. Sum of all cells H2 to H10	C. $= H2/G7$
	D. $= (H2 + H10)$
	E. $= G7 + H2$
	F. $= 0.75 * C6$
	G. $= \text{SUM}(H2 : H10)$
	H. $= G7 * H2$

27. Six cans of pop cost \$2.39, a 12-pack costs \$4.98 and a 24-pack costs \$9.98. What is the best unit price? (Answer in dollars and cents.)

Record your answer neatly on the Response Form.

28. Gas costs 71.5 cents per litre. How many litres can be purchased for \$20.00?
- A. 0.28
 - B. 3.58
 - C. 14.30
 - D. 27.97

29. A calculator is marked down from \$18.00 to \$14.00. Approximately what is the percent decrease?
- A. 4
 - B. 12
 - C. 22
 - D. 77

**REFER TO
DATA BOOKLET**

**Use the Sales Taxes in Canada Map in the Data Booklet
to answer question 30.**

30. How much would be saved if a \$10 000 ring was purchased in Alberta rather than in Quebec?
- A. \$750
 - B. \$1500
 - C. \$7500
 - D. no savings
31. In Montreal's Olympic ballpark, the straightaway centre field distance is 125 m. In most American ballparks the straightaway centre field distance is 400 feet. Therefore, most American center field distances are greater than Montreal's Olympic center field distance.
- A. True
 - B. False

32. To measure the length of a room, which of the following units would be appropriate?

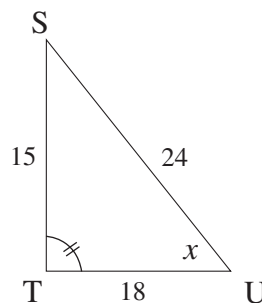
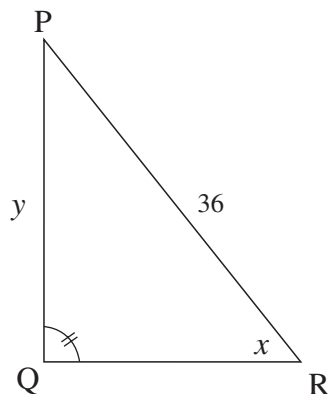
I.	Yards
II.	Square feet
III.	Metres
IV.	Cubic centimetres

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

33. Sine is to hypotenuse as tangent is to which of the following?

- A. adjacent
- B. cosine
- C. opposite
- D. hypotenuse

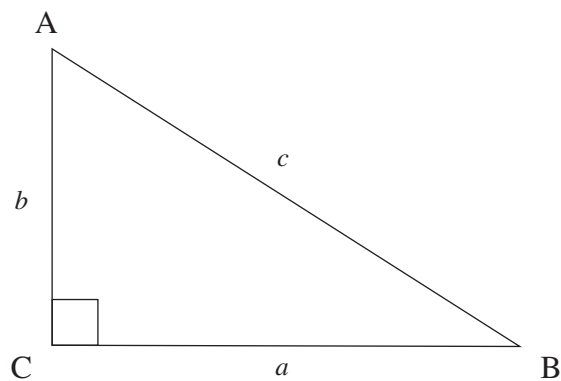
34. What is the value of y ? (Answer to one decimal place.)



Record your answer neatly on the Response Form.

35. A 20 m tower casts a shadow 7.8 m long. At the same time a tree's shadow is 5.2 m long. Which of the following is the height of the tree in metres? (Round to the nearest tenth.)
- A. 7.8
 - B. 13.3
 - C. 17.4
 - D. 20.2

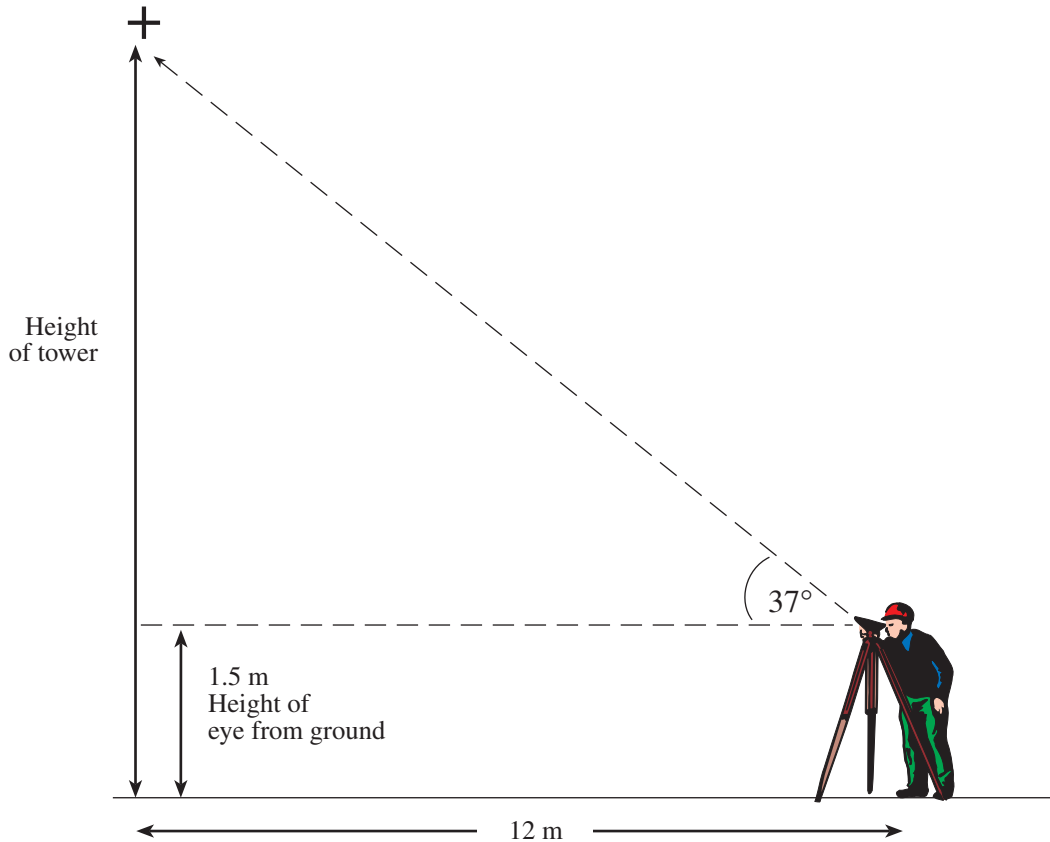
36. Given right triangle ABC with $a = 10$, $b = 4$, $c = 10.77$. What is the measure of $\angle A$?



- A. 22°
- B. 43°
- C. 47°
- D. 68°

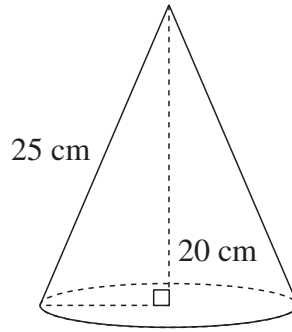
Use the following information to answer questions 37 and 38.

Jack is using his clinometer to find the height of the tower. He reads the angle of elevation to be 37° . Jack's eye is 1.5 m from the ground, and Jack is 12 m from the tower.



37. Which trigonometric ratio is most appropriate to find the height of the tower?
- A. sine
 - B. cosine
 - C. tangent
 - D. not enough information
38. How high is the tower from the ground? (Answer to the nearest tenth of a metre.)
- A. 9.0
 - B. 9.6
 - C. 10.5
 - D. 11.1

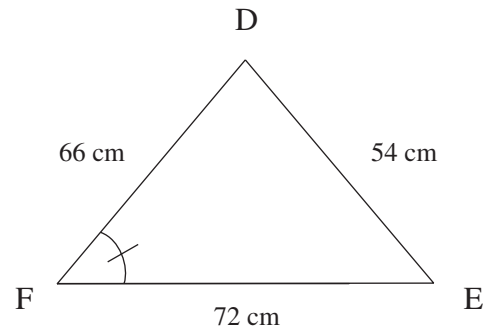
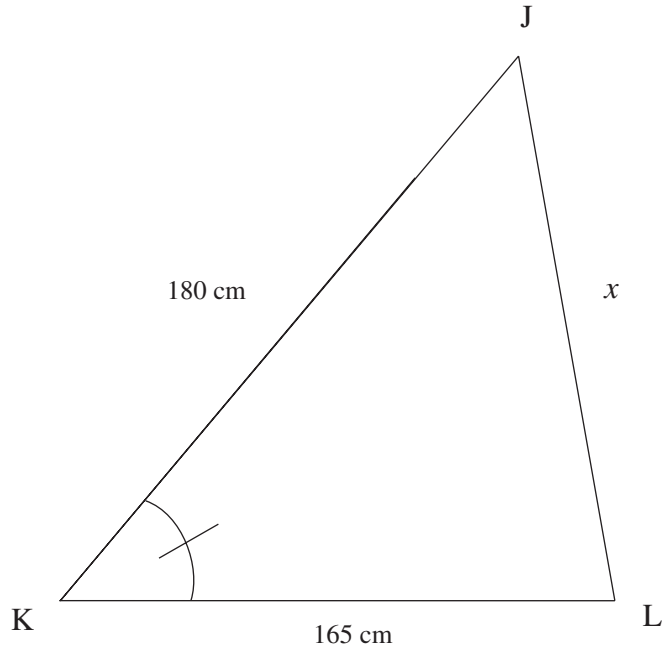
Use the following diagram to answer questions 39 to 41.



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
<p>39. Which formula will calculate the surface area around the cone?</p> <p>40. What is the volume of the cone in cubic centimetres?</p> <p>41. If the 25 cm measurement remained the same but the radius was doubled, then by what factor would the side surface area of the cone be changed by?</p>	<p>A. πr^2</p> <p>B. $\pi r s$</p> <p>C. $\pi r s + \pi r^2$</p> <p>D. 2</p> <p>E. 4</p> <p>F. 314.2</p> <p>G. 628.3</p> <p>H. 4712.4</p>

Use the following diagrams to answer question 42.



42. In the above similar triangles, what is the value of x ?

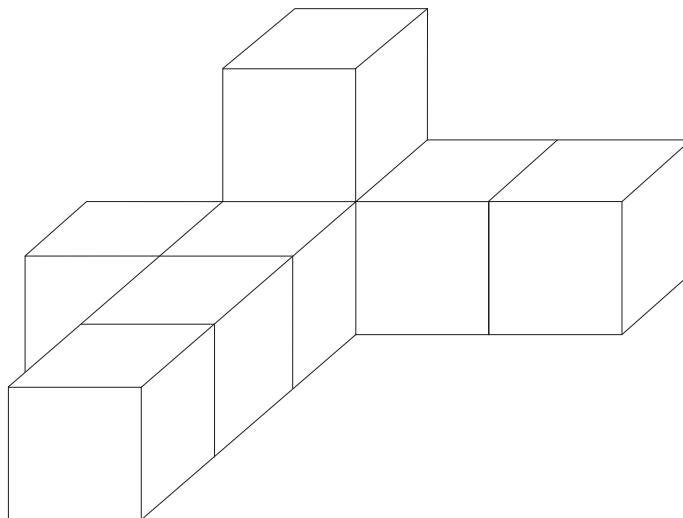
Record your answer neatly on the Response Form.

43. An aircraft passenger compartment is approximately 60 feet long, 8 feet wide and 7 feet high. What is the best **estimate** of the volume of air in the compartment?
- A. 75 ft^2
 - B. 75 ft^3
 - C. 3000 ft^3
 - D. 3360 ft^2
44. Which measure best describes a point between $2\frac{3}{4}$ inches and $3\frac{1}{2}$ inches?
- A. 5.9 cm
 - B. 6.5 cm
 - C. 7.8 cm
 - D. 9.0 cm

45. A scale drawing shows a mosquito at 60 times its actual size. If the drawing is 30 cm long, what is the actual length of the mosquito?
- A. 5 cm
 - B. 2 mm
 - C. 5 mm
 - D. 0.05 cm

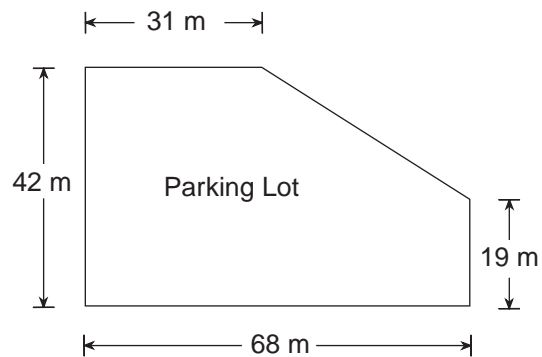
46. Tagging salmon is an example of the capture-mark-recapture method of estimating populations.
- A. True
 - B. False

47. What is the total cost of material required to cover this object, including the bottom, if material costs $\$0.60/\text{cm}^2$. Each cube is 1 cm^3 .



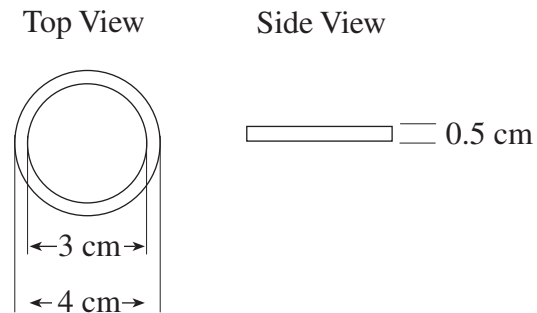
- A. \$10.20
- B. \$20.40
- C. \$21.60
- D. \$28.80

48. Wally wants to repave his parking lot. If asphalt costs $\$10.00/\text{m}^2$, approximately how much would it cost to repave the entire area?



- A. $\$22\,000.00$
- B. $\$24\,000.00$
- C. $\$26\,000.00$
- D. $\$28\,000.00$

49. Andrea is making a silver ring in the school shop.

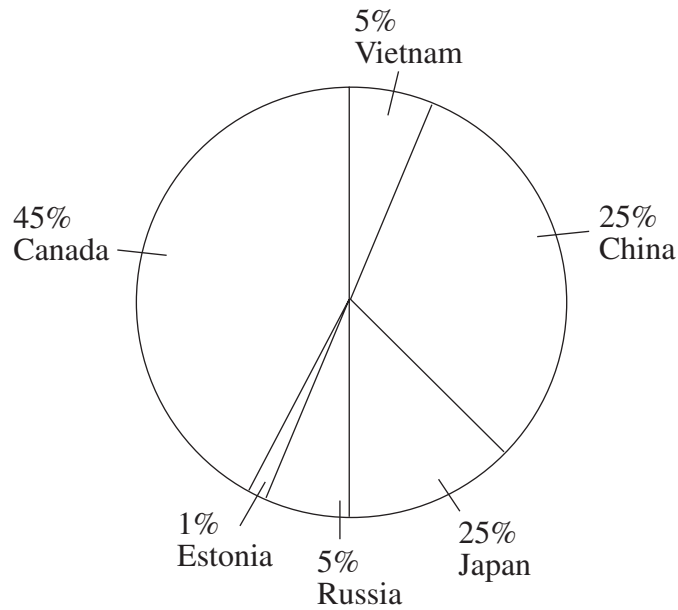


How many cubic centimetres of silver are needed to make the ring? (Round answer to two decimal places.)

Record your answer neatly on the Response Form.

Use the following information to answer questions 50 to 52.

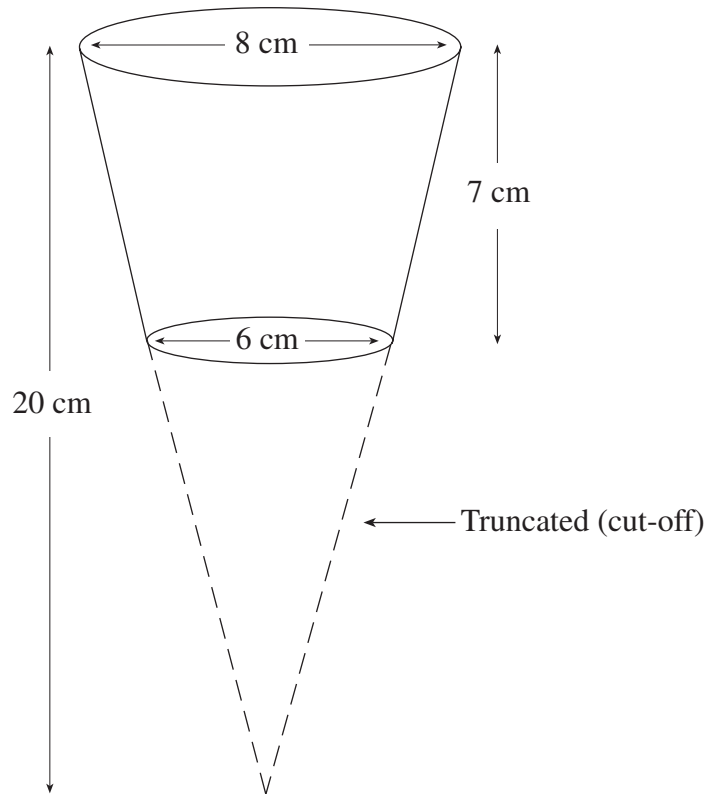
The following data was collected from a telephone survey of 100 people. They were asked to name their country of origin. A circle graph was drawn to represent the data.



**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
50. Which country besides China is misrepresented in the drawing according to the data?	A. Vietnam B. Canada
51. How many degrees should China's representation be on the graph?	C. Russia D. Japan
52. Which country should be represented with an angle of about 160° ?	E. 90° F. 45° G. 25° H. 180°

Use the following diagram to answer question 53.



53. The yogurt container in the diagram is in the form of a truncated cone. What is the volume of the yogurt container? (Answer to the nearest cubic centimetre.)
- A. 213 cm^3
 - B. 269 cm^3
 - C. 335 cm^3
 - D. 850 cm^3
54. Brushy Creek School has 800 students. Students were asked to vote for a new mascot. The results were that 22 preferred an eagle, 36 preferred a tiger and 42 preferred an armadillo. What is the sample size?
- A. 22
 - B. 42
 - C. 100
 - D. 800

55. Giving the same math test to twenty randomly selected grade 10 classes throughout the province is an example of which sampling method?
- A. Cluster
 - B. Systematic
 - C. Simple Random
 - D. Stratified Random

56. A sprinter recorded his times as follows:

9.2, 8.8, 9.0, 9.2, 10.4, 9.2, 8.8, 8.7, 9.1

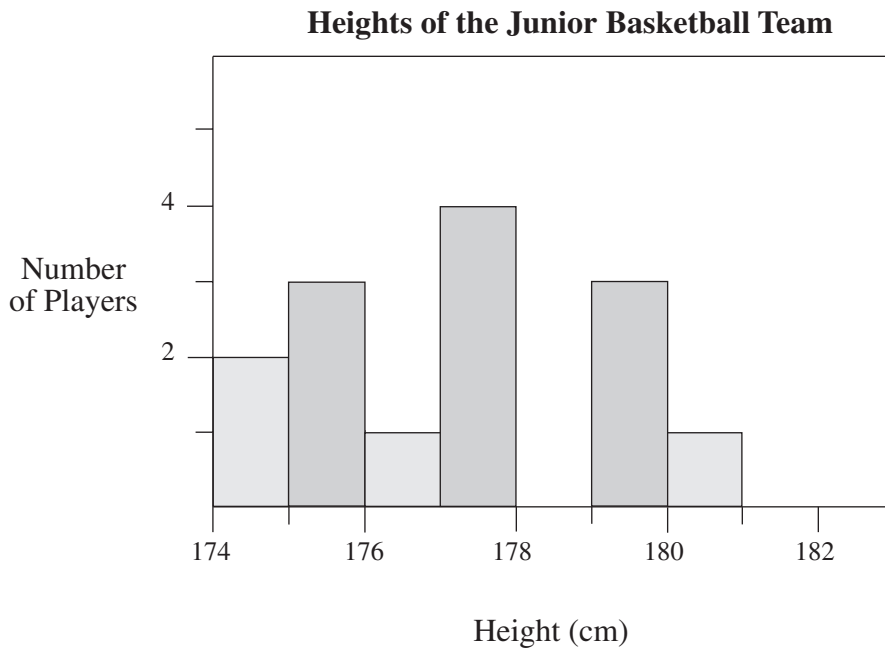
What is the median?

- A. 9.0
 - B. 9.1
 - C. 9.2
 - D. 10.4
57. What number could be added to the numbers below so that the mean, median and mode are the same?

18	12	19
15	27	23

Record your answer neatly on the Response Form.

Use the following graph to answer question 58.



58. How many players are on the team?

- A. 11
- B. 12
- C. 13
- D. 14

59. Rank the following in order from what would be expected to be the most accurate to the least accurate method of data collection about Canadian's favourite TV show.

I.	All Canadians surveyed
II.	1000 randomly selected Canadians
III.	1000 people from Vancouver
IV.	Everyone in B.C.

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

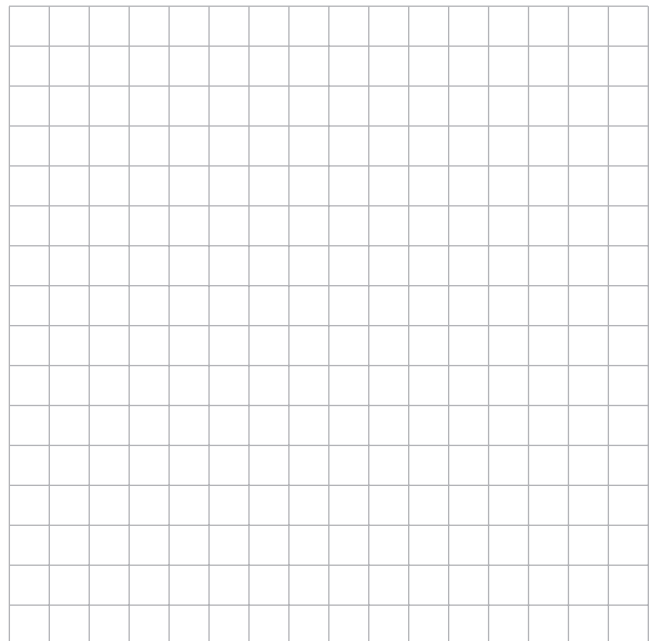
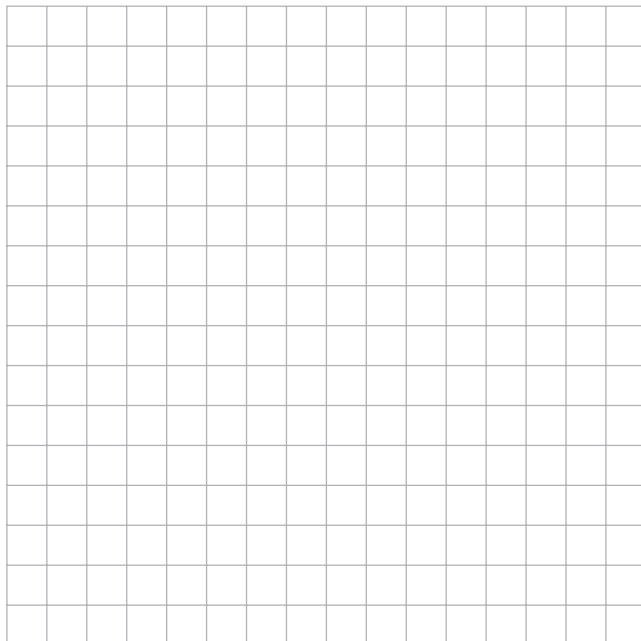
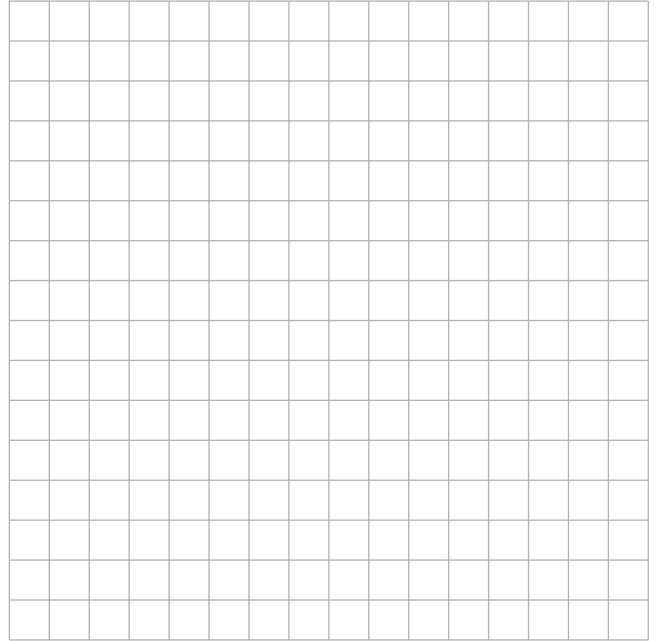
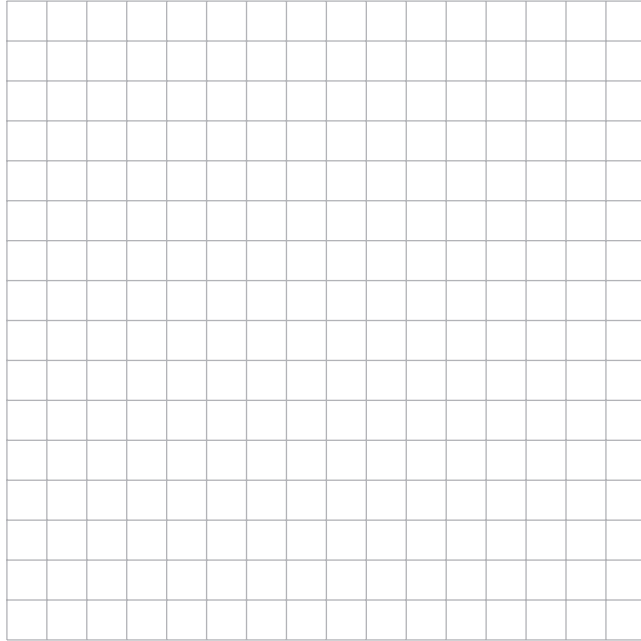
60. Organizers of this year's bass fishing tournament are trying to estimate how many bass will be caught. Before the tournament started, they found that three out of the 30 boats on the lake caught 10, 8, and 17 bass. Using the quadrant method, which answer is the best estimate of the number of bass that will be caught during the tournament?
- A. 116
 - B. 170
 - C. 300
 - D. 350

END OF EXAMINATION

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ROUGH WORK FOR GRAPHING

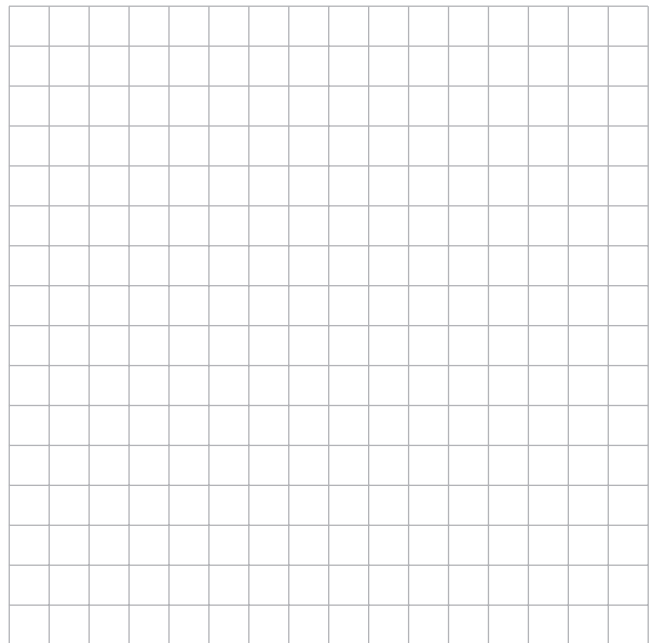
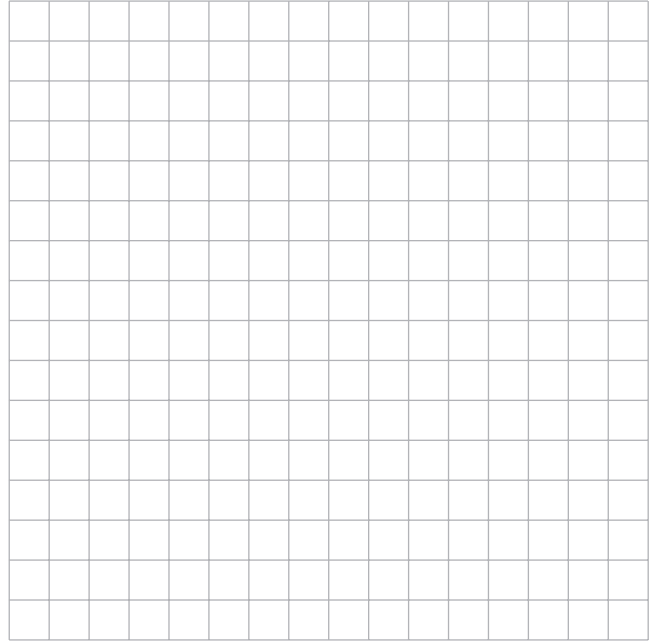
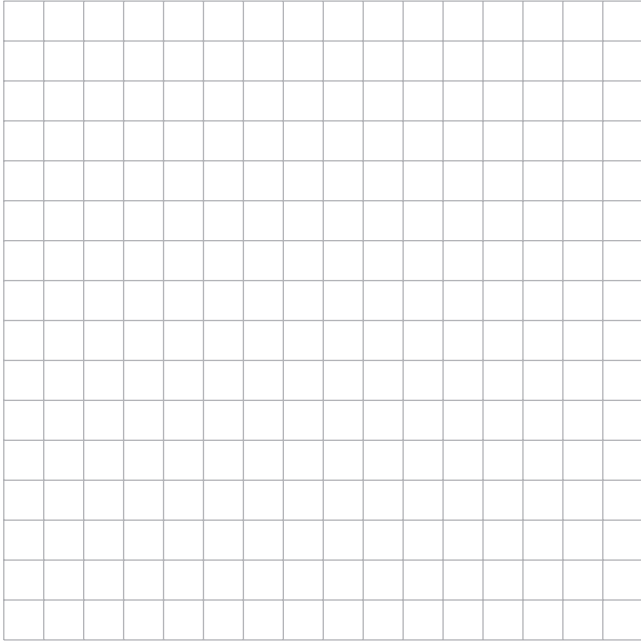
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Exercise care when tearing along perforations.**

ROUGH WORK FOR GRAPHING

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ROUGH WORK SPACE

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ROUGH WORK SPACE