



Please note that the 2007/08 exams for this course will follow the content and the format of the Sample Examination for 2007/08. The following exam is for reference only and is not necessarily representative of the exams for the 2007/08 school year.

Applications of Mathematics 10

Sample Exam A

(Updated November 2006)

DO NOT OPEN ANY EXAMINATION MATERIALS UNTIL INSTRUCTED TO DO SO.

Examination Instructions

1. On your Answer Sheet, fill in the bubble (Form A, B, C, D, E, F, G or H) that corresponds to the letter on this Examination Booklet.
2. Use a pencil to fill in bubbles when answering questions on your Answer Sheet.
3. When answering **Numerical-Response** questions on your Answer Sheet:

- print digits as illustrated:



- shade the bubble with the negative symbol if the answer is negative; shade or leave blank the bubble with the positive symbol if the answer is positive.
- write your answer in the spaces provided using one digit per box, noting proper place value.
- leave unused boxes blank. For example, the answer -70.6 will be written as shown:



4. When using your calculator:
 - use the programmed value of π rather than the approximation of 3.14.
 - rounding should occur only in the final step of the solution.
5. Diagrams are not necessarily drawn to scale.
6. When the examination begins, remove the data pages located in the centre of this booklet.
7. Read the Examination Rules on the back of this booklet.

Use the following table to answer questions 1 and 2.

Item	Original Price (\$)	Discount (%)	Discount Amount (\$)	Discount Price (\$)
Mountain Bike	399.99	20		
Rollerblades	289.99		72.50	217.49

1. What is the Discount Price of the Mountain Bike?

- A. \$20.00
- B. \$80.00
- C. \$319.99
- D. \$379.99

2. What is the Discount (%) of the Rollerblades?

- A. 20%
- B. 25%
- C. 33%
- D. 75%

Use the following information to answer questions 3 and 4.

A furniture store owner takes out two loans as shown in the spreadsheets below.

Store Purchase Loan

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Annual Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2	2006	100 000.00	7.5	7 500.00	17 072.70	90 427.30
3	2007	90 427.30	7.5	6 782.05	17 072.70	80 136.65
4	2008	80 136.65	7.5	6 010.25	17 072.70	69 074.20

Furniture Supply Loan

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Annual Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2	2006	50 000.00	8.5	4 250.00	10 980.35	43 269.65
3	2007	43 269.65	8.5		10 980.35	35 967.22
4	2008		8.5		10 980.35	

3. What is the total Interest Charged for both loans in the year 2007?
- A. \$10 459.97
 B. \$11 750.00
 C. \$13 564.10
 D. \$43 561.25
4. Which formula below would calculate the Closing Balance in 2008 for the Furniture Supply Loan?
- A. = B4 + D4 – E4
 B. = B4 – D4 – E4
 C. = B4 + D4 + E4
 D. = B4 – D4 + E4

Use the following table to answer question 5.

Province or Territory	GST (%)	PST (%)
Alberta	6	no tax
British Columbia	6	7
Manitoba	6	7
Northwest Territories	6	no tax
Nunavut	6	no tax
Ontario	6	8
Prince Edward Island	6	10
Quebec	6	7.5
Saskatchewan	6	7
Yukon	6	no tax

5. Kaiden buys a DVD for \$35.99. If Kaiden buys the DVD in Saskatchewan, what is the total price?

Record your answer neatly on the Answer Sheet.

6. A spreadsheet is created to track a loan.

	A	B	C	D	E	F	G
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Extra Payment (\$)	Closing Balance (\$)
2	1	25 000.00	9	2 250.00	3 895.50	0	23 354.50
3	2	23 354.50	9	2 101.91	3 895.50	0	21 560.91
4	3	21 560.91	9	1 940.48	3 895.50	10 000.00	9 605.89
5	4	9 605.89	9	864.53	3 895.50	0	6 574.92

If the Interest Rate in Year 4 is changed, which of the following cells would change?

- A. B5
- B. D4
- C. D5
- D. E5

7. A table is created to track a loan.

Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
1	20 000.00	6.25	1 250.00	4 000.00	17 250.00
2	17 250.00	6.50	1 121.25	4 000.00	14 371.25
3	14 371.25	6.75			

What is the Interest Charged on the loan in Year 3?

- A. \$898.20
- B. \$934.13
- C. \$970.06
- D. \$9700.59

8. Ming needs four new tires for his car. He finds the following ads in the newspaper.

Can City Tires



Get 4 New Tires for \$189.99!

Julie's Tires



\$46.25 Each Tire

Each Tire \$57.05

20% off the total purchase!



Tire Town

Wheels & Tires

Each Tire \$62.66



Buy 3 and get 1 free!

Store	Original Price (\$)	Discount	Discounted Price (\$)
Can City Tires	189.99		
Julie's Tires	46.25		
Tire Town	57.05		
Wheels & Tires	62.66		

At which store would Ming get the best price?

- A. Can City Tires
- B. Julie's Tires
- C. Tire Town
- D. Wheels & Tires

9. Kirsten decides to go to Japan. She needs to convert \$250 US to Japanese yen.

		Currency You Have			
		Canadian Dollar (\$)	US Dollar (\$)	British Pound (£)	Japanese Yen (¥)
Currency You Want	Canadian Dollar (\$)	1	1.36724	2.2117	0.011280
	US Dollar (\$)	0.7314	1	1.6177	0.008250
	British Pound (£)	0.4521	0.61816	1	0.005100
	Japanese Yen (¥)	88.6500	121.21212	196.0700	1

Which exchange rate would she use?

- A. 0.011280
- B. 1.36724
- C. 88.6500
- D. 121.21212

10. The two locations of Lily’s Flowers sell roses, tulips and carnations. The two locations sold the following amounts of flowers and made \$0.12 profit per flower.

	Location A	Location B
Roses	50	40
Tulips	66	34
Carnations	80	102

What was Lily’s Flowers total profit?

- A. \$21.84
- B. \$23.52
- C. \$44.64
- D. \$372.00

11. Collin is using his weekly budget in Canadian dollars to determine the amount international students would need in their currency if they wanted to live in Canada.

Collin's weekly budget in Canadian dollars

Housing	Food	Transportation	Utilities	Entertainment
\$210	\$80	\$50	\$35	\$60

Exchange rates for \$1 Canadian

	US Dollar (\$)	Australian Dollar (\$)	European Euro (€)	British Pound (£)
\$1 Canadian Dollar	0.7279	1.1028	0.6442	0.4482

What would the **total** weekly budget be in Australian dollars? Answer to two decimal places.

Record your answer neatly on the Answer Sheet.

12. A spreadsheet is created to track a loan.

	A	B	C	D	E	F	G
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Extra Payment (\$)	Closing Balance (\$)
2	1	25 000.00	9	2 250.00	3 895.50	0	23 354.50
3	2	23 354.50	9	2 101.91	3 895.50	0	21 560.91
4	3	21 560.91	9	1 940.48	3 895.50	10 000.00	9 605.89
5	4	9 605.89	9	864.53	3 895.50	0	6 574.92
6	5	6 574.92	9	591.74	3 895.50	0	3 271.16
7	6	3 271.16	9	294.40	3 565.56	0	0

Which formula would calculate G4?

- A. = B3 + D3 – E3
- B. = B4 + D4 + E4 – F4
- C. = B4 + D4 – E4
- D. = B4 + D4 – E4 – F4

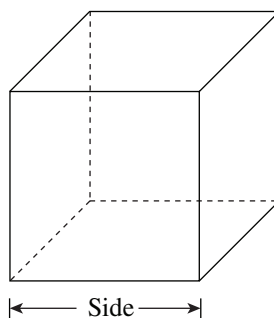
13. Anu is calculating the surface area of a cylinder to two decimal places. The cylinder has a radius of 3 cm and a height of 4 cm. If Anu made an error, in which step did it occur?

Anu's Steps	
A.	$SA = 2\pi(3)^2 + 2\pi(3)(4)$
B.	$SA = 2\pi(9) + 2\pi(12)$
C.	$SA = 131.95 \text{ cm}^2$
D.	There is no error.

14. The volume of a cube is 5 cm^3 .

What is the length of each side?

- A. 1.67 cm
 B. 1.71 cm
 C. 2.24 cm
 D. 125 cm



15. A cone and a cylinder both have a height of 10 cm. Their volumes are below.

Cone	Cylinder
$V = 210 \text{ cm}^3$	$V = 581 \text{ cm}^3$

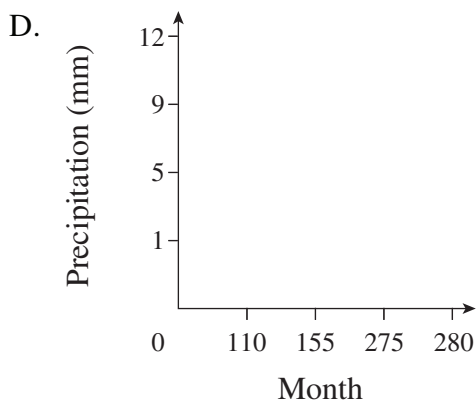
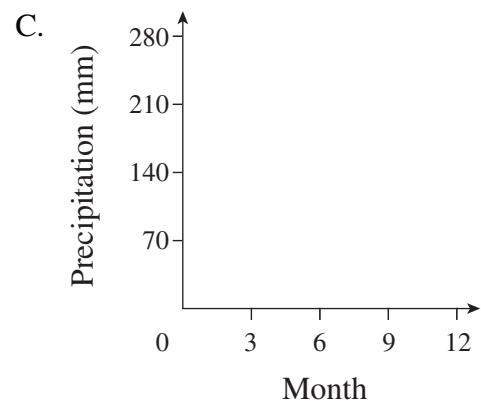
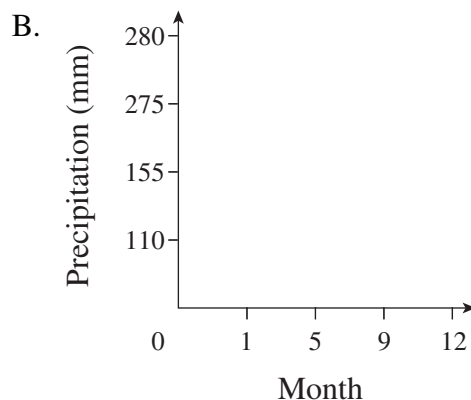
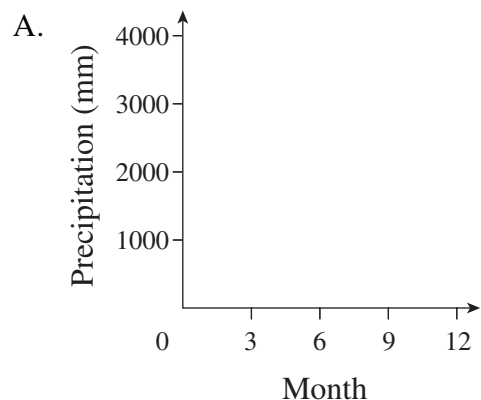
Which of the following statements is correct about the radii of the shapes?

- A. The radius of the cone is greater.
 B. The radius of the cylinder is greater.
 C. The radii of both shapes are equal.
 D. The relationship cannot be determined from the information given.

16. The following table shows the data for the precipitation in Vancouver. The amount of precipitation in millimetres depends on the month.

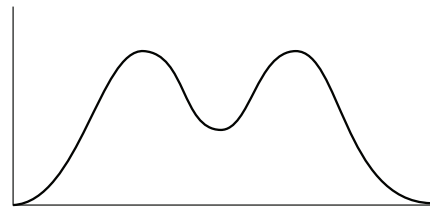
Month	Precipitation (mm)
1	275
5	155
9	110
12	280

Which of the following graphs has the most suitable scales for the data above?



17. Which situation best describes the graph?

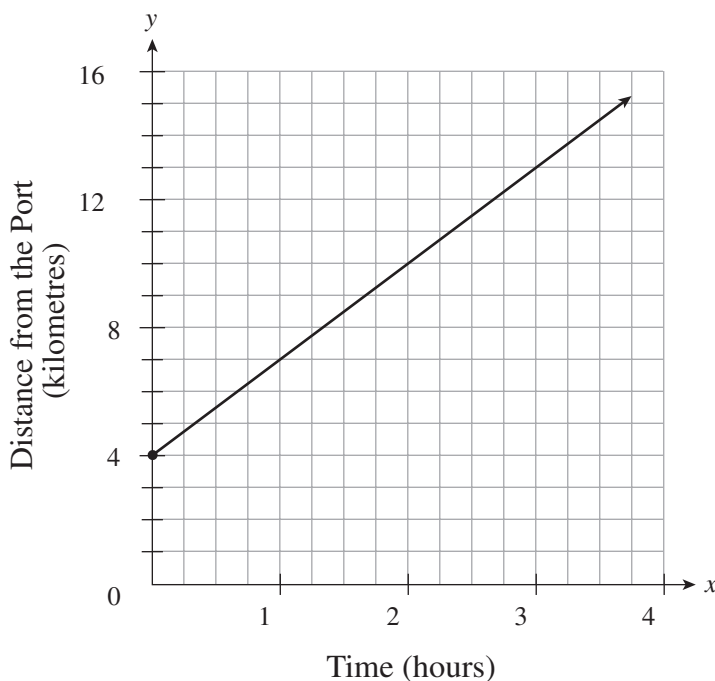
- A. The distance travelled over time on a one-way car trip.
- B. The cost of parking in a pay parking lot over time.
- C. The number of cars in the school parking lot during one day.
- D. The cost of renting a car for an initial fee plus a charge per kilometre travelled.



18. A factory makes tents. The cost of running the factory is \$300 per day plus \$50 for each tent made. What is the total cost (C), in dollars, as a function of the number of tents (t) made?

- A. $C = 350t$
- B. $C = 50t + 300$
- C. $C = 300t + 50$
- D. $t = 300 + 50C$

19. The graph below models the distance of a boat leaving from a port over time.



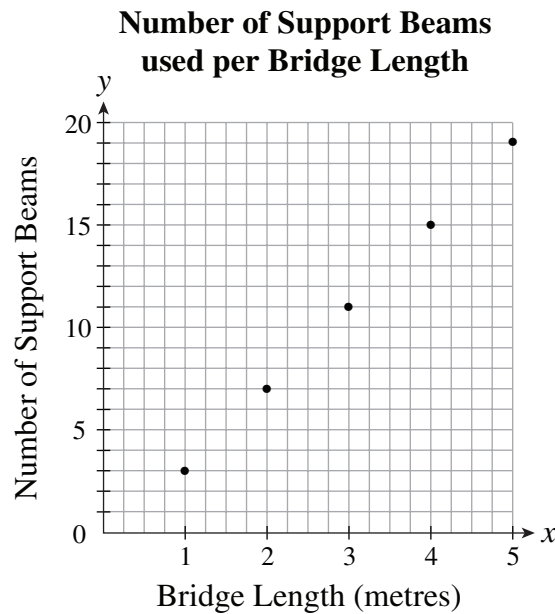
After 6.75 h, how far will the boat be from the port? Answer to two decimal places.

Record your answer neatly on the Answer Sheet.

20. Students sell tickets for a raffle. If the students sell 500 tickets, they lose \$250. If the students sell 1500 tickets, they make a profit of \$250. How many tickets do they need to sell to “break even” (no loss or gain)?

- A. 0 tickets
- B. 250 tickets
- C. 1000 tickets
- D. 2000 tickets

21. Data for various bridges is plotted, where the number of support beams used depends on the length of the bridge.



What is the domain of the above graph?

- A. {1, 2, 3, 4, 5}
- B. {3, 7, 11, 15, 19}
- C. All numbers between 1 and 5 inclusive.
- D. All numbers.

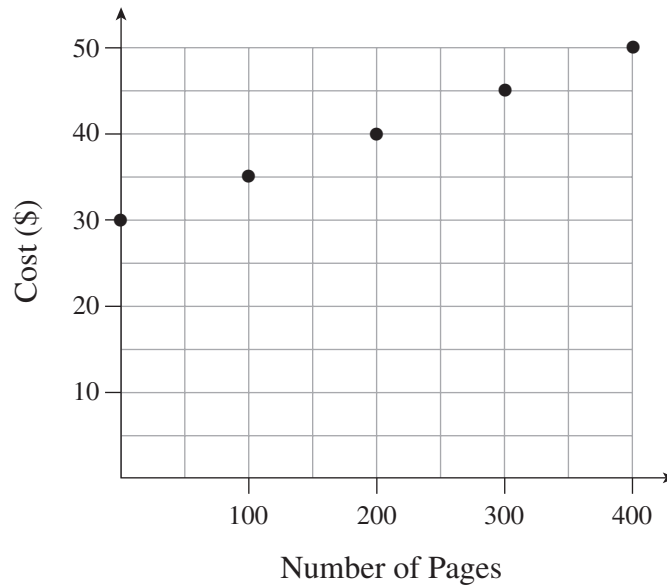
22. Given the function $y = -2x + 8$, what is the y-intercept?

- A. (-2, 0)
- B. (0, -2)
- C. (0, 8)
- D. (8, 0)

23. Given the function $y = -2x + 8$, what is the x -intercept?

- A. $(-4, 0)$
- B. $(4, 0)$
- C. $(0, 8)$
- D. $(8, 0)$

24. The following graph shows the cost, C , in dollars, of printing a workbook with n pages.



Which of the following represent the data in the graph above?

I.	$C = 30 + 0.5n$
II.	$(0, 30) (100, 35) (200, 40) (300, 45) (400, 50)$
III.	The cost of printing a workbook is \$30 plus a charge of \$0.05 per page.

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

Use the following information to answer questions 25 and 26.

A school hosts a dance. The profit, P , in dollars, is represented by the function $P(n) = 4n - 100$, where n is the number of tickets sold.

25. What is the initial cost of the dance before any tickets are sold?

- A. 0
- B. 4
- C. 25
- D. 100

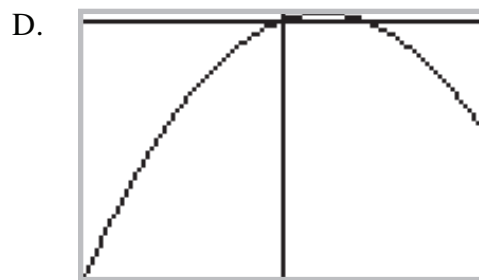
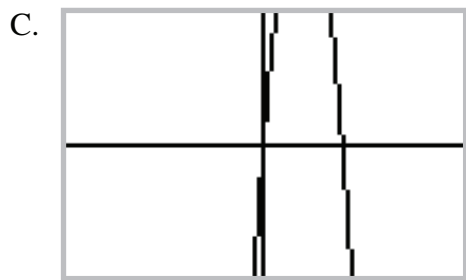
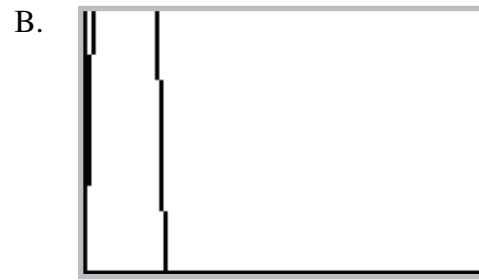
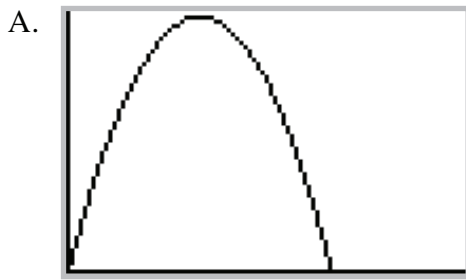
26. What is n when $P(n) = 1400$?

- A. 325
 - B. 375
 - C. 450
 - D. 5500
-

27. The function $F(C) = 1.8C + 32$ is used to convert temperatures from Celsius to Fahrenheit, where F is temperature in degrees Fahrenheit and C is temperature in degrees Celsius. What is $F(15)$? Answer to the nearest degree.

Record your answer neatly on the Answer Sheet.

28. Which of the following best represents the graph of the function $h(t) = 19.5t - 4.9t^2$ on a graphing calculator for values of t between 0 and 6 and values of h between 0 and 20?



29. Wally wants to advertise his restaurant in the local newspaper. The cost in dollars (C) to run an advertisement for (d) days is given by the formula:

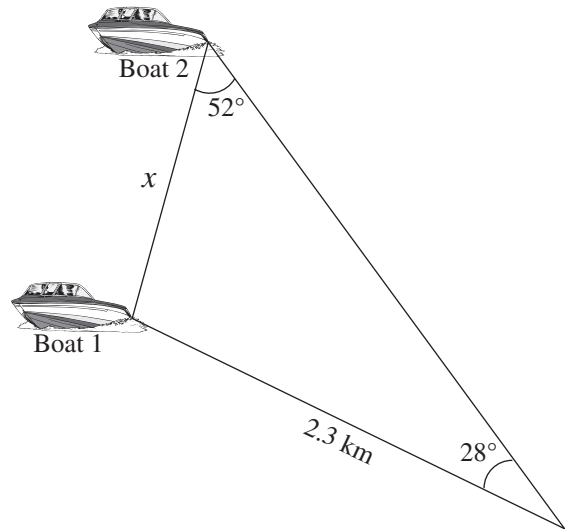
$$C = 12 + 5.5d$$

Which of the following represents the cost per day to run an advertisement?

- A. \$5.50
 B. \$12
 C. \$17.50
 D. C
30. The height, h , in cm, of a burning candle is modelled by the equation $h = 20 - 1.5t$. Which window settings below would be the most appropriate for this situation?
- | | | | |
|--------------------------|-----------------------|--------------------------|----------------------|
| A. $x \text{ min} = -10$ | $y \text{ min} = -10$ | B. $x \text{ min} = -10$ | $y \text{ min} = 5$ |
| $x \text{ max} = 10$ | $y \text{ max} = 10$ | $x \text{ max} = 10$ | $y \text{ max} = 35$ |
| C. $x \text{ min} = 0$ | $y \text{ min} = 0$ | D. $x \text{ min} = 0$ | $y \text{ min} = 0$ |
| $x \text{ max} = 10$ | $y \text{ max} = 10$ | $x \text{ max} = 14$ | $y \text{ max} = 20$ |

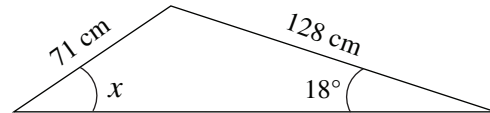
31. Using the diagram, what is the distance, x , between the two boats?

- A. 1.2 km
- B. 1.4 km
- C. 3.9 km
- D. 4.3 km



32. What is the measure of angle x ?

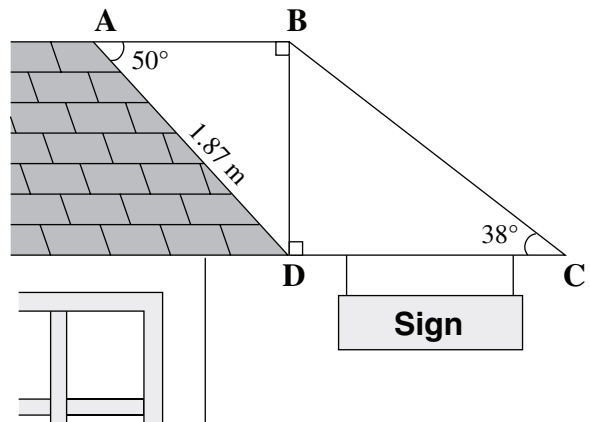
- A. 34°
- B. 56°
- C. 61°
- D. 72°



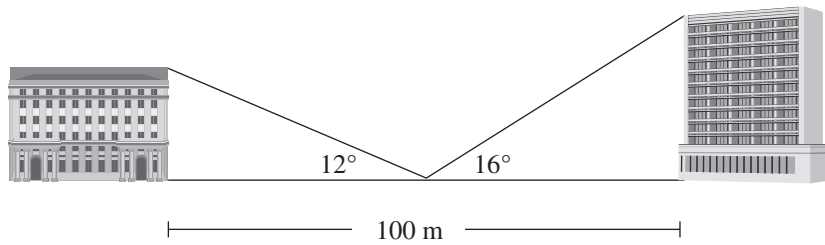
33. In order to hang a sign horizontally from the side of a roof, a special bracket must be created. The bracket is constructed of two right triangles $\triangle ABD$ and $\triangle BCD$ as shown.

If the side of the roof, AD , is 1.87 m long, what length, in metres, is bracket piece DC ?

- A. 1.83 m
- B. 1.12 m
- C. 2.33 m
- D. 2.85 m



34. Two buildings are 100 m apart. From a point **midway** between them, the angles to their tops are 12° and 16° .

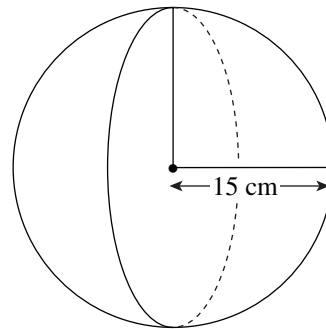


How much taller is one building than the other? Answer to two decimal places.

Record your answer neatly on the Answer Sheet.

35. What is the correct formula for calculating the surface area of the sphere?

- A. $SA = \frac{4}{3}\pi(15)^3$
 B. $SA = 4\pi(30)$
 C. $SA = 4\pi(15)^2$
 D. $SA = 4\pi(30)^2$



36. Which of the following are true for $\sin A = 0.8660$, where $0 \leq A < 180^\circ$?

I.	$A = 30^\circ$
II.	$A = 60^\circ$
III.	$A = 120^\circ$
IV.	$A = 150^\circ$

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

37. The dimensions of a square are increased by a scale factor of $3 : 2$. By what scale factor will the square's area be increased?

- A. $3 : 2$
- B. $6 : 4$
- C. $9 : 4$
- D. $27 : 8$

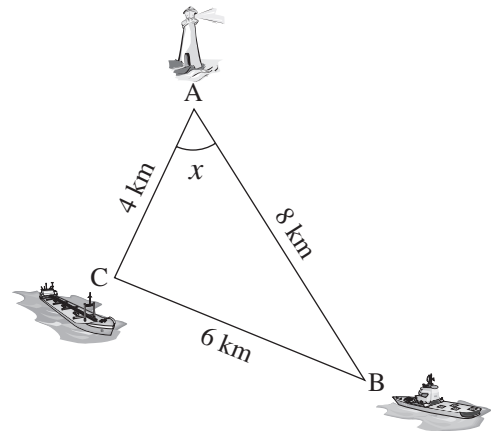
38. If the volume of a sphere is 588.98 cm^3 , what is the surface area of the sphere?

- A. 113.26 cm^2
- B. 339.80 cm^2
- C. 498.66 cm^2
- D. 1766.93 cm^2

39. A lighthouse is located at point A with ships at points B and C as shown in the diagram.

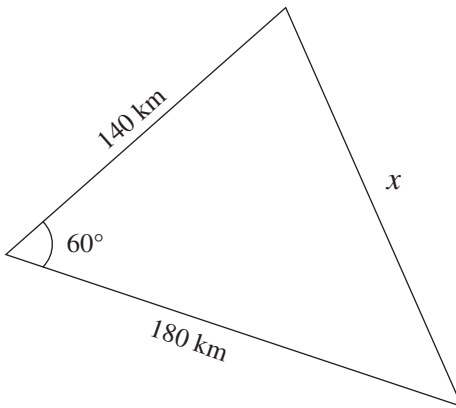
What is the angle, x , between the two ships?

- A. 47°
- B. 49°
- C. 56°
- D. 104°



(Diagram not to scale.)

40. A triangular park is shown below.



What is the length, x , in metres, of the third side of the park?
Answer to one decimal place.

Record your answer neatly on the Answer Sheet.

41. A carpenter uses a tape measure to measure a door frame that is 0.81 m wide and 2.13 m high. What is the precision of the tape measure?
- A. 0.5 m
 - B. 0.1 m
 - C. 0.05 m
 - D. 0.01 m

42. Sam measured out four pieces of wood to build a bookcase. The following are the measurements.

I.	500 mm
II.	6.2 cm
III.	16 inches
IV.	2 feet

Which sequence places the measurements in order from **smallest** to **largest**?

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

43. What is the best estimate for the length of a new pencil?

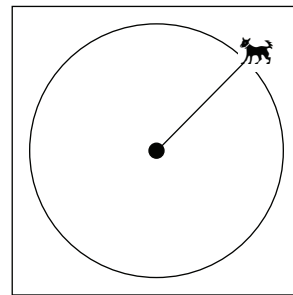
- A. 18 mm
- B. 18 cm
- C. 18 inches
- D. 18 feet

44. The speed of a ball is 6 m/s. What is its speed in kilometres per hour?

- A. 21 600 km/h
- B. 360 km/h
- C. 21.6 km/h
- D. 0.006 km/h

45. Jilly, the dog, is tied to a 3-metre leash. George bought Jilly a new 6-metre leash. How many times larger is the new area that Jilly can cover?

- A. 8 times
- B. 4 times
- C. 3 times
- D. 2 times



46. Two survey workers stop every 4th car at an intersection to check if the occupants of the car are wearing seatbelts. What is this sampling method called?

- A. systematic sampling
- B. simple random sampling
- C. self-selected sampling
- D. cluster sampling

47. Kelly remembers all the steps for conducting a survey, but cannot remember the order. The steps she remembers are as follows:

I.	From the data, make inferences about the entire population.
II.	Identify the population.
III.	Organize and interpret the data.
IV.	Choose a sampling method.
V.	Collect data from the sample.

What is the correct order of steps?

- A. II, IV, V, I, III
 B. II, IV, V, III, I
 C. IV, II, V, I, III
 D. IV, II, V, III, I
48. A survey of 6 people was used to compare the hours spent watching TV with I.Q.

Number of Hours Watching TV	I.Q.
3	106
2	85
4	120
1	100
5	90
2	130

What is the correlation coefficient for the data? Answer to two decimal places.

Record your answer neatly on the Answer Sheet.

49. The winning student council president received 36% of the votes cast at her high school election. What generalization can be made on the election?
- A. More girls voted for her than boys.
- B. Not every student voted in the election.
- C. Approximately $\frac{1}{3}$ of the total student population voted for her.
- D. There must have been more than two candidates for student council president.
50. The table below gives the area and rent for several apartments in downtown Vancouver. The cost of an apartment is dependant on its size.

Area (ft²)	400	465	700	650	726	1200	550
Rent (\$)	725	750	1000	850	950	1625	800

What is the linear regression equation for this data?

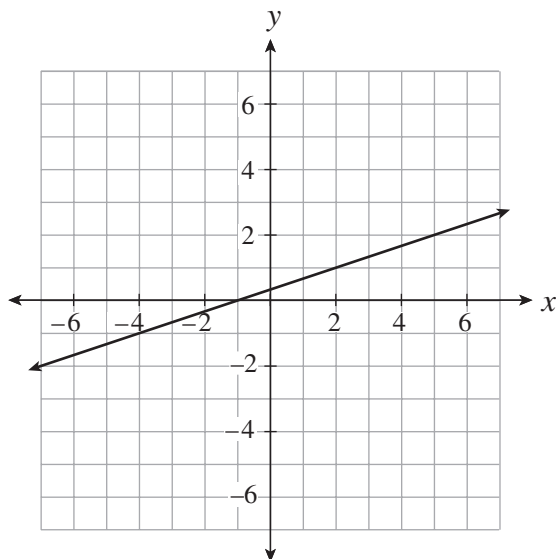
- A. $y = 0.90x - 192.5$
- B. $y = 0.83x - 122.39$
- C. $y = 1.04x - 251.44$
- D. $y = 1.16x + 179.80$
51. Given the following values for the correlation coefficient r :

0.6, 0, -0.8 and 1

What is the order of **strongest correlation** to **weakest correlation**?

- A. -0.8, 0, 0.6, 1
- B. 0, -0.8, 0.6, 1
- C. 1, -0.8, 0.6, 0
- D. 1, 0.6, 0, -0.8

Use the following graph of a line to answer question 52.

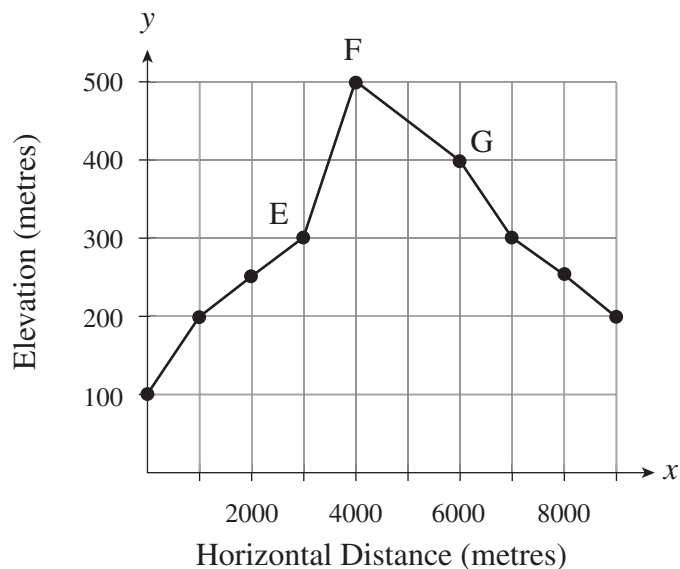


I.	The equation of the line is $y = \frac{1}{3}x + \frac{1}{3}$
II.	The point (11, 4) passes through the line.

52. Which of the statements are true?

- A. I only
- B. II only
- C. I and II
- D. none are true

Use the following information to answer questions 53 to 55.



53. The graph shows the elevation profile for a hiking trail. If the hiking group starts at an elevation of 100 m, what is the **elevation** when they stop to rest halfway up the trail?

- A. 250 m
- B. 300 m
- C. 500 m
- D. 3000 m

54. What is the shortest distance from E to F?

- A. 1000 m
- B. 1020 m
- C. 1200 m
- D. 4420 m

55. What is the slope of FG?

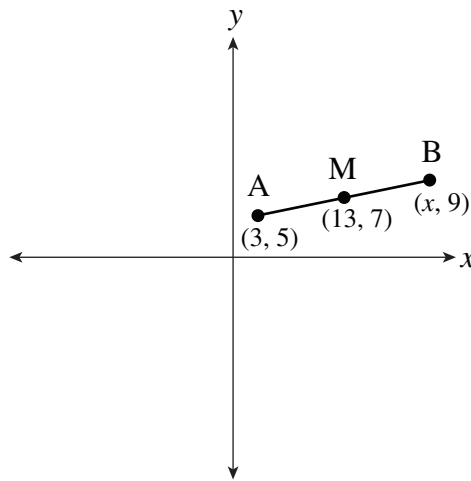
- A. $-\frac{1}{20}$
- B. $\frac{1}{2}$
- C. 20
- D. -2

56. Which of the following statements is true for the lines $y = \frac{3}{2}x - 5$ and $y = \frac{2}{3}x - 5$?

I.	The lines are parallel.
II.	The lines are perpendicular.

- A. I only
B. II only
C. both I and II
D. neither I nor II

57. What is the length of line segment AB? Answer to two decimal places.



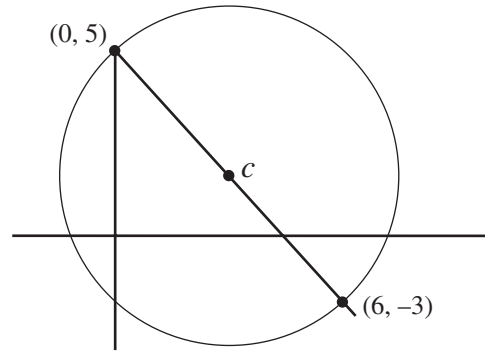
Record your answer neatly on the Answer Sheet.

58. What is the slope of a line parallel to line $y = \frac{2}{5}x + 3$?

- A. $-\frac{5}{2}$
B. $-\frac{1}{3}$
C. $\frac{2}{5}$
D. 3

59. What is the length of the radius of the circle?

- A. $r = 5$
- B. $r = 6.32$
- C. $r = 10$
- D. $r = 10.30$



60. Mark's house is located at $(-2, 3)$. Mark's friend Chris lives 3 blocks north and 2 blocks east of Mark's house. Which of the following are true about the line between their homes?

I.	The slope is $\frac{3}{2}$
II.	The x -intercept is $(-4, 0)$
III.	The equation of the line is $y = \frac{3}{2}x + 6$

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

END OF EXAMINATION