

Applications of Mathematics 10

2008/09 Released Exam

April 2009

Form A

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.

You have **Examination Booklet Form A**. In the box above #1 on your **Answer Sheet**, fill in the bubble as follows.

Exam Booklet Form/ Cahier d'examen	A	B	C	D	E	F	G	H
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use the following information to answer questions 1 and 2.

The following table represents the repayment of a \$25 000 loan for the first 3 years.

Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
1	25 000.00	9	2 250.00	3 895.50	23 354.50
2	23 354.50	9	2 101.91	3 895.50	21 560.91
3	21 560.91	9	1 940.48	3 895.50	19 605.89

- Which formula will calculate the Closing Balance for any year of the loan?
 - Opening Balance + Interest Charged + Annual Payment
 - Opening Balance + Interest Charged – Annual Payment
 - Opening Balance – Interest Charged + Annual Payment
 - Opening Balance – Interest Charged – Annual Payment

- What is the **total** Interest Charged in the first 3 years?
 - \$5 394.11
 - \$5 821.44
 - \$6 292.39
 - \$11 686.50

Use the following information to answer questions 3 and 4.

The following table represents the sale of several items in a grocery store.

Item	Item Price (\$)	Number Sold	Revenue (\$)
Bag of Cereal	5.69		1507.85
Bag of Pasta	2.35		1327.75
Yogurt	1.95	158	

3. What is the **total** number of items sold?
- A. 158
 - B. 830
 - C. 988
 - D. 3144
4. How many **more** Bags of Pasta does the store need to sell so the total Revenue for all three items will be approximately \$3500?
- A. 152
 - B. 283
 - C. 924
 - D. 1489

5. Susan takes out a \$1000 loan. The spreadsheet below shows the repayment of the loan for the first four years.

	A	B	C	D	E	F	G
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Additional Payment (\$)	Closing Balance (\$)
2	2002	1000.00	8	80.00	125.00	0.00	955.00
3	2003	955.00	8	76.40	125.00	0.00	906.40
4	2004	906.40	8	72.51	125.00	0.00	853.91
5	2005	853.91	8	68.31	125.00	0.00	797.22

If Susan is able to make an Additional Payment of \$250.00 in 2003 only, what is the new Opening Balance in 2004?

Record your answer neatly on the Answer Sheet.

6. An employee is given the following pay increase: 3% the first year, 4% the second year, and 5% in the third year.

Year	Starting Salary (\$)	Rate of Increase (%)	Amount of Pay Increase (\$)	End of Year Salary (\$)
1	45 000.00	3	1 350.00	46 350.00
2	46 350.00	4		
3		5		

Using the table above, what is the employee's salary at the end of Year 3?

- A. \$46 350.00
- B. \$49 172.72
- C. \$50 521.50
- D. \$50 614.20

Use the following information to answer questions 7 and 8.

Christine has one loan for \$25 000 and another loan for \$10 000. The repayment of her loans for the first two years is shown below.

Loan 1

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2	1	25 000.00	4.75	1 187.50	1 600.00	24 587.50
3	2	24 587.50	4.75	1 167.91	1 600.00	24 155.41

Loan 2

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2	1	10 000.00	5.2	520.00	850.00	9 670.00
3	2	9 670.00	5.2	502.84	850.00	

7. What is the combined total for the Annual Payments for both loans in Year 2 **only**?
- A. \$779.25
 - B. \$1 670.75
 - C. \$2 450.00
 - D. \$4 900.00
8. If Christine takes out a new loan to combine these two loans at the beginning of Year 3, what will be the amount of the new loan?
- A. \$33 478.25
 - B. \$34 527.50
 - C. \$35 000.00
 - D. \$67 735.75

Use the following information to answer questions 9 and 10.

Jonathan invests \$3500.00 in an account that earns 3.25% per year. He makes an Additional Investment of \$300.00 at the end of each year. The spreadsheet below represents the first two years of the investment.

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Earned (\$)	Additional Investment (\$)	Closing Balance (\$)
2	2005	3500.00	3.25	113.75	300.00	3913.75
3	2006	3913.75	3.25	127.20	300.00	4340.95

9. If the Interest Rate changes to 3.1% in **2007**, in which cell will he enter this new Interest Rate?

- A. C3
- B. C4
- C. D3
- D. D4

10. If Jonathan changes his Additional Investment to \$400.00 in **2006**, what will be the Closing Balance in that year?

- A. \$3640.95
- B. \$4240.95
- C. \$4340.95
- D. \$4440.95

11. The following table shows the repayment of a \$2000 loan for the first 3 years.

Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
1	2000.00	8	160.00	450.00	1710.00
2	1710.00	8	136.80	450.00	1396.80
3	1396.80	8	111.74	450.00	1058.54

How much of the \$2000 loan has been paid off at the end of Year 3?
Answer in dollars and cents.

Record your answer neatly on the Answer Sheet.

12. Scott invests \$1500.00 in an account with an interest rate that changes every year.

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Earned (\$)	Annual Investment (\$)	Closing Balance (\$)
2	1	1500.00	2.5	37.50	200.00	1737.50
3	2	1737.50	3.0	52.13	200.00	1989.63
4	3	1989.63	2.75	54.71	200.00	2244.34

Which formula will calculate the Closing Balance of the investment in Year 3?

- A. = B4 – D4 – E4
- B. = B4 + D4 + E4
- C. = B4 – D4 + E4
- D. = B4 + D4 – E4

13. The following table represents the growth of an investment.

Month	Opening Balance (\$)	Interest Rate (%)	Interest Earned (\$)	Monthly Investment (\$)	Closing Balance (\$)
1	1500.00	3.5	52.50	200.00	1752.50
2	1752.50	3.5	61.34	200.00	2013.84
3	2013.84	3.5	70.48	150.00	2234.32
4	2234.32	3.5	78.20		2412.52

What is the Monthly Investment in Month 4?

- A. \$100.00
- B. \$150.00
- C. \$178.20
- D. \$220.48

14. Emily graduated from university and has two loans to pay off. The partial repayment tables for the loans are shown below.

Loan 1

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2	1	25 000.00	4.2	1 050.00	5 000.00	21 050.00
3	2	21 050.00	4.1	863.05	5 000.00	16 913.05

Loan 2

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2	1	10 000.00	2.9	290.00	2 400.00	7 890.00
3	2	7 890.00	2.9	228.81	2 400.00	5 718.81

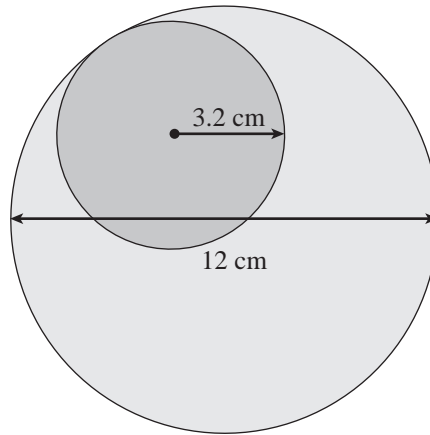
Combined Loan

	A	B	C	D	E	F
1	Year	Opening Balance (\$)	Interest Rate (%)	Interest Charged (\$)	Annual Payment (\$)	Closing Balance (\$)
2						

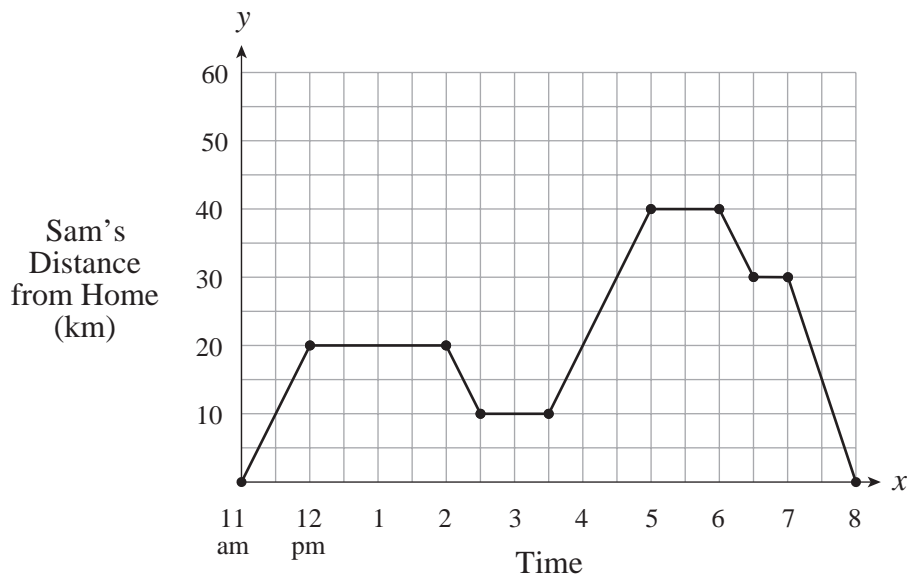
At the start of Year 2, the bank offers to combine both loans into a new loan with an interest rate of 3.7%. How much does Emily save in interest charges in Year 2 by taking out the new Combined Loan?

- A. \$21.08
- B. \$203.14
- C. \$207.73
- D. \$269.22

15. A plate is 12 cm in diameter. A circular cookie has a radius of 3.2 cm. What percentage of the plate's area does the cookie cover?



- A. 25.2%
 B. 26.7%
 C. 28.4%
 D. 53.3%
16. The following graph represents Sam's trip.



When does Sam travel the fastest?

- A. 11:00 a.m. to 12:00 p.m.
 B. 2:00 p.m. to 2:30 p.m.
 C. 3:30 p.m. to 5:00 p.m.
 D. 7:00 p.m. to 8:00 p.m.

17. Kelynn is asked to graph the line $y = 3x + 12$ in her graphing calculator using **only** values of x from 0 to 6. Which of the window settings below should she use?

- A. $x \text{ min} = -10$ $y \text{ min} = -10$
 $x \text{ max} = 10$ $y \text{ max} = 10$

- B. $x \text{ min} = -4$ $y \text{ min} = 0$
 $x \text{ max} = 0$ $y \text{ max} = 6$

- C. $x \text{ min} = 6$ $y \text{ min} = 0$
 $x \text{ max} = 0$ $y \text{ max} = 6$

- D. $x \text{ min} = 0$ $y \text{ min} = 0$
 $x \text{ max} = 6$ $y \text{ max} = 30$

18. Which table of values best describes the rule “double the x -value and subtract 2”?

A.

x	y
0	0
2	4
4	8

B.

x	y
0	2
2	6
4	10

C.

x	y
0	-2
2	0
4	2

D.

x	y
0	-2
2	2
4	6

19. The function $A(n) = 5n - 500$ represents the amount of money received from ticket sales at a school dance where:
- $A(n)$ is the amount of money in dollars
 - n is the number of tickets sold

What is $A(150)$? Answer in dollars and cents.

Record your answer neatly on the Answer Sheet.

20. Two salespeople, Holly and Garrett, are paid a monthly amount based on the sales they make.

Holly	Garret
\$1400 plus 10% commission on all sales, s	$P = 0.24s$ where P is the monthly pay based on the sales, s

If Holly and Garrett each made \$10 000 worth of sales, which of the following statements is true about their monthly pay?

- A. Holly made between \$1 and \$499 more in pay than Garrett.
- B. Holly made between \$500 and \$999 more in pay than Garrett.
- C. Garrett made between \$1 and \$499 more in pay than Holly.
- D. Garrett made the same amount of pay as Holly.

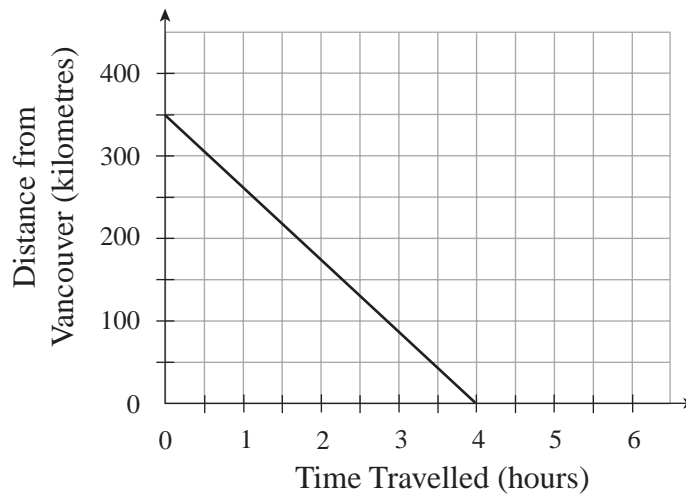
21. Cranbrook Cabs charges its customers a fixed fee plus \$0.80 per kilometre travelled. If a customer were charged \$16.75 for an 18 km trip, how much would the customer pay for a 36 km trip?

- A. \$28.80
- B. \$31.15
- C. \$33.50
- D. \$45.55

22. What is the y-intercept of the equation $y = -5x + 35$?

- A. 35
- B. 7
- C. 5
- D. -5

23. A car is travelling towards Vancouver at a constant speed. The car's distance from Vancouver is dependent on the time travelled, as shown in the graph below.



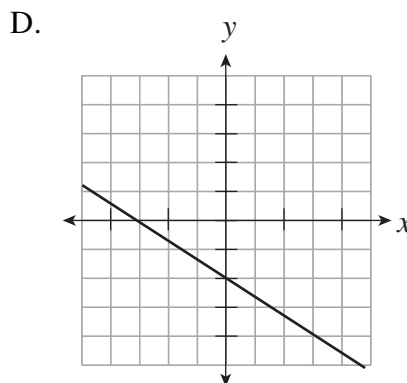
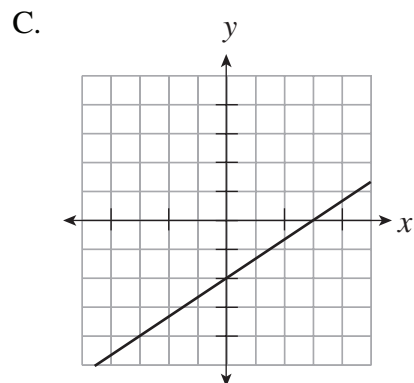
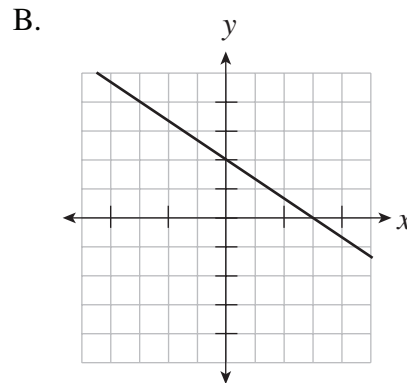
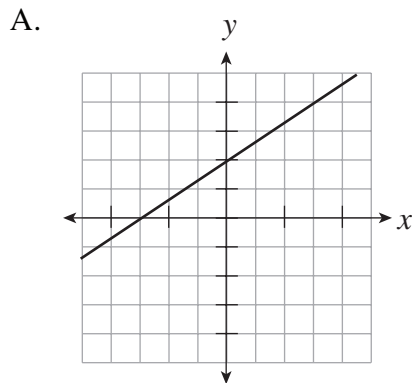
Which of the following statements is correct?

- A. The domain of the graph is 0 to 4 hours.
- B. The domain of the graph is 0, 1, 2, 3, 4 hours.
- C. The domain of the graph is 0 to 350 kilometres.
- D. The domain of the graph is 0, 50, 100, 150, 200, 250, 300, 350 kilometres.

24. The total monthly cost of using a cell phone consists of a fixed cost of \$18.99 plus a charge of \$0.15 per minute of use. Which of the statements below are correct?

I.	The total monthly cost function is $C(t) = 18.99 - 0.15t$.
II.	The total monthly cost of using the phone for 60 minutes is \$27.99.

- A. I only
 B. II only
 C. both I and II
 D. neither I nor II
25. Which of the choices below shows the correct graph of the equation $y = \frac{2}{3}x - 2$?



26. Jocelyn needs to rent a van to drive the basketball team 450 km to a tournament in Fort St. John.

Rent-a-Van	Inter-Rentals
$C = 40.00 + 0.28d$, where C is the total cost of renting and d is the distance driven in kilometres.	The fixed amount is \$15.00 greater than Rent-a-Van but the cost per kilometre is \$0.04 less than Rent-a-Van.

What is the cost of renting the van from Inter-Rentals?

- A. \$163.00
 - B. \$166.00
 - C. \$169.00
 - D. \$199.00
27. The formula $N = 600 - 24d$ represents the number of tickets remaining for a school dance where:
- N is the number of tickets remaining
 - d is the number of days the tickets have been for sale

How many tickets will be remaining after ten days of sales? Answer to the nearest ticket.

Record your answer neatly on the Answer Sheet.

28. Jordan is paid a salary that consists of a base amount of \$1200 every month plus a commission of 8% on every dollar of clothing that she sells.

Which table of values below best represents Jordan's salary?

A.

Amount of Clothing Sold (\$)	Jordan's Salary (\$)
0	1200
2000	1360
4000	1520
8000	1840

B.

Amount of Clothing Sold (\$)	Jordan's Salary (\$)
0	1200
2000	2800
4000	3600
8000	7600

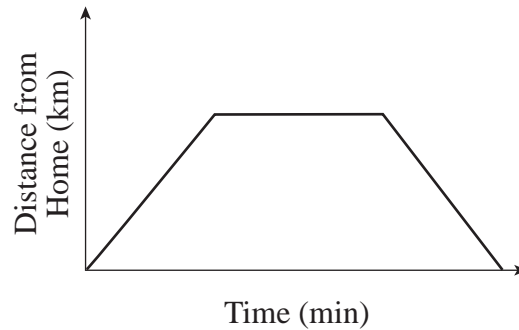
C.

Amount of Clothing Sold (\$)	Jordan's Salary (\$)
0	1200
2000	2400
4000	3600
8000	4800

D.

Amount of Clothing Sold (\$)	Jordan's Salary (\$)
0	0
2000	160
4000	320
8000	640

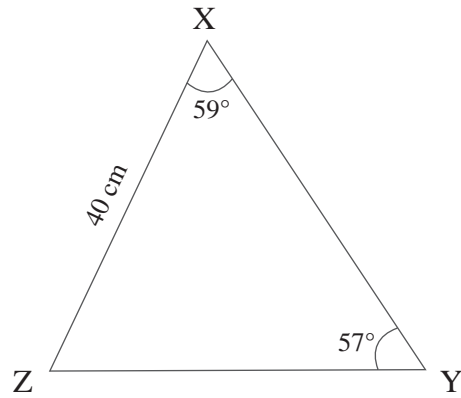
29. The graph below shows the distance in kilometres that Tullio is from home.



Which scenario below best describes Tullio's journey?

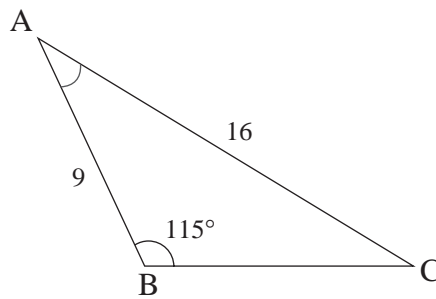
- A. Tullio leaves school for the store, stops to buy a snack, and then walks home.
 - B. Tullio leaves home for the store, stops to buy a snack, and then walks back home.
 - C. Tullio leaves home for the store, stops to buy a snack, and then walks to the school.
 - D. Tullio leaves school for the store, stops to buy a snack, and then walks back to the school.
30. Blackburn Music offers to sell an electric guitar for an initial payment of \$95.00 plus 18 equal monthly payments. If the total cost of the guitar is \$770.00 (taxes included), how much is each monthly payment?
- A. \$5.28
 - B. \$37.50
 - C. \$42.78
 - D. \$48.06
31. How many possible angles will satisfy the equation $\sin A = 0.0698$ when $\angle A$ is between 0° and 180° ?
- A. 0
 - B. 1
 - C. 2
 - D. 4

32. What is the measure of side YZ?



- A. 39.1 cm
- B. 40.9 cm
- C. 42.9 cm
- D. 55.6 cm

33. What is the measure of $\angle A$?

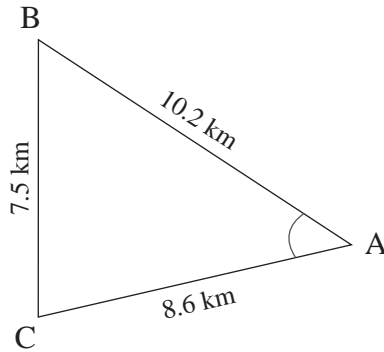


- A. 30°
- B. 33°
- C. 34°
- D. 56°

34. Howard wants to fill his car up with gasoline. If he knows that the gasoline tank's capacity is 55 L, then what is the tank's capacity in gallons? Answer to the nearest gallon.

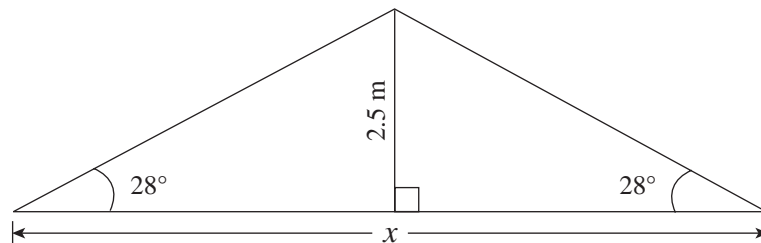
Record your answer neatly on the Answer Sheet.

35. A hiking trail has been marked out with distances as shown in the diagram below.



What is the measure of $\angle A$?

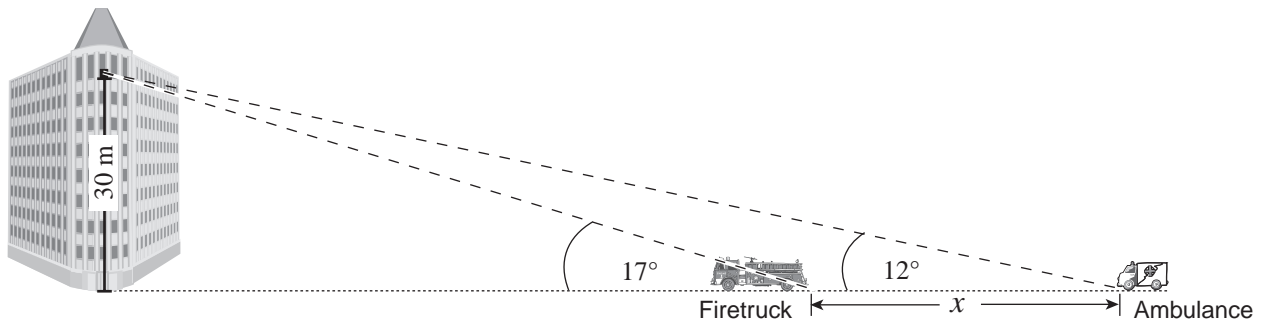
- A. 46°
 - B. 47°
 - C. 56°
 - D. 78°
36. The side view of a roof is shown in the diagram below.



What is the width, x , of the roof?

- A. 2.7 m
- B. 4.7 m
- C. 9.4 m
- D. 10.7 m

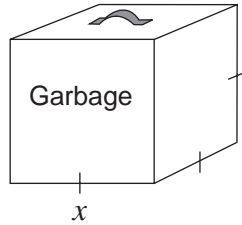
37. Lorynne looks out the window 30 m above the street and sees a firetruck on the street and an ambulance behind it as shown in the diagram below.



How far apart, x , are the ambulance and firetruck?

- A. 30 m
 - B. 42 m
 - C. 43 m
 - D. 98 m
38. A plumber needs to determine the volume of material of a pipe. Which tool would the plumber use to determine the measurement of the outside diameter and the inside diameter of the pipe?
- A. micrometer
 - B. tape measure
 - C. trundle wheel
 - D. Vernier caliper

39. A covered garbage bin has a surface area of 15 m^2 .



What is the length of one side, x , of the garbage bin?

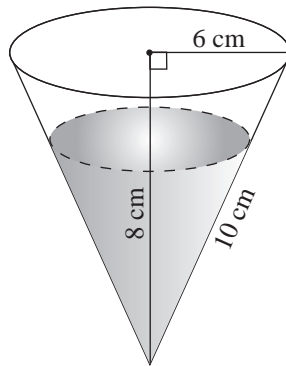
- A. 1.3 m
 - B. 1.6 m
 - C. 2.5 m
 - D. 3.9 m
40. A model train was built at a scale of $1 : 40$. If the length of the model was 25 cm, then what was the length of the actual train, in **metres**? Answer to the nearest metre.

Record your answer neatly on the Answer Sheet.

41. A swimming pool is 5 m wide, 2 m deep and 20 m long. If a pump drains water from the pool at $0.3 \text{ m}^3/\text{min}$, then how long will it take to drain the pool?
- A. 60 min
 - B. 90 min
 - C. 667 min
 - D. 1000 min

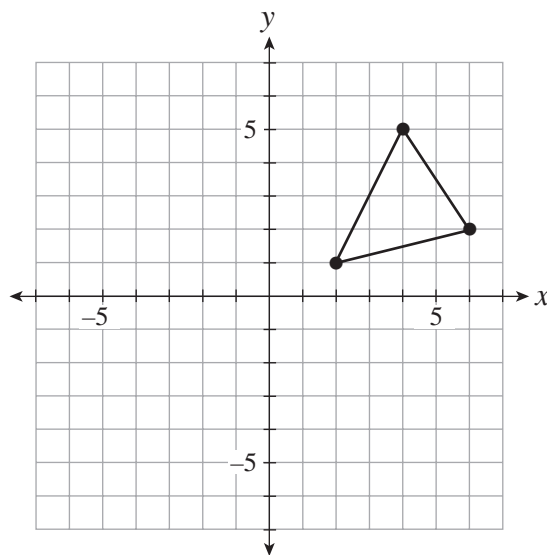
42. A spherical balloon has a radius of 10 cm. If $10\,000\text{ cm}^3$ of additional air are pumped into the balloon, what is the new radius of the balloon?
- A. 13 cm
 - B. 15 cm
 - C. 30 cm
 - D. 58 cm
43. The surface area of a golf ball is 15 cm^2 greater than the surface area of a table-tennis ball. If the radius of a table-tennis ball is 1.85 cm, then what is the radius of the golf ball?
- A. 2.1 cm
 - B. 2.9 cm
 - C. 4.6 cm
 - D. 6.8 cm
44. A small gas container costs \$5.32 to fill. How much will it cost to fill a gas container with dimensions twice as large as the smaller container?
- A. \$5.32
 - B. \$21.28
 - C. \$31.92
 - D. \$42.56

45. A paper cup at a water dispenser has a conical shape as shown in the diagram below.



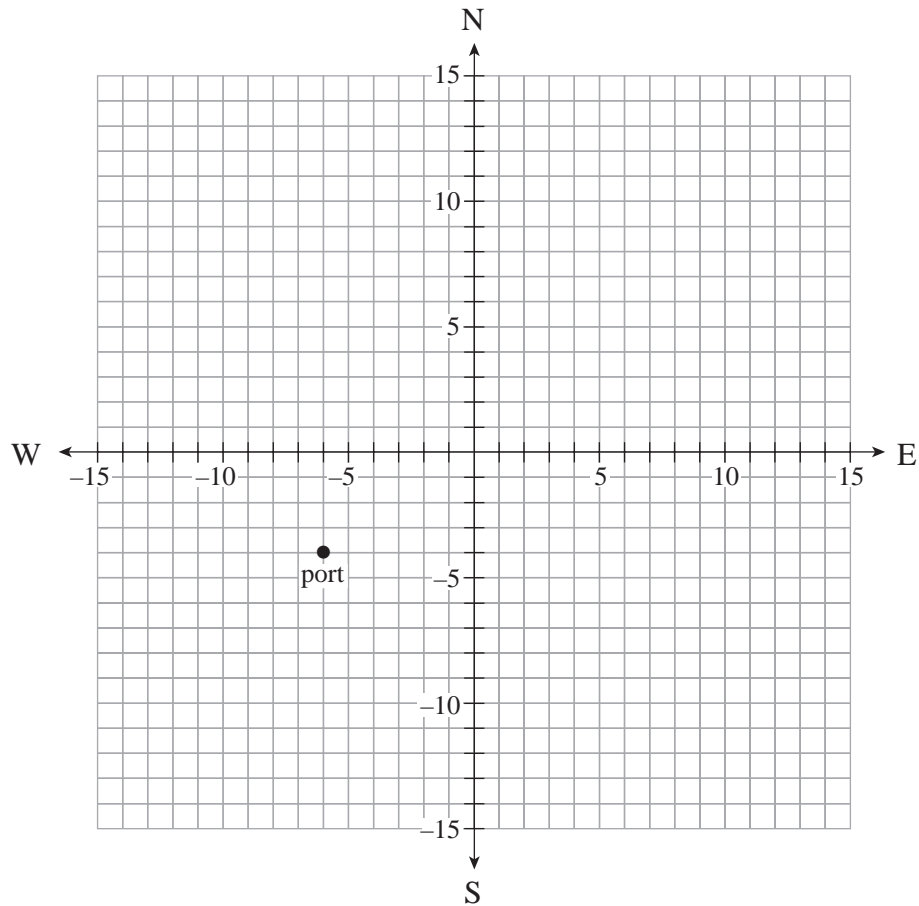
The cup is full of water. If half of the water is poured out, what is the volume of water left in the cup?

- A. 151 cm^3
 - B. 189 cm^3
 - C. 302 cm^3
 - D. 377 cm^3
46. Which of the following would be best used to find the perimeter of the figure below?



- A. Midpoint Formula
- B. Distance Formula
- C. Slope Formula
- D. Sine Law

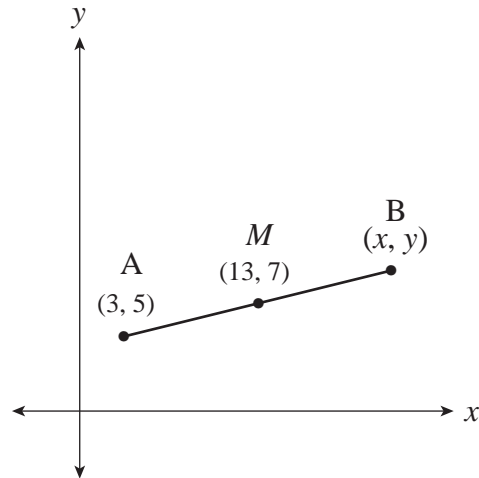
47. Two ships leave a port at the same time. Ship A travels east at a speed of 7 km/h and Ship B travels north at a speed of 9 km/h. How far apart are the ships after **two** hours?



- A. 10.2 km
 B. 11.4 km
 C. 22.8 km
 D. 25.1 km
48. A sorting centre is located **halfway** between two mail delivery buildings. The coordinates of the delivery buildings are $(-3, 9)$ and $(5, -12)$. What is the x -coordinate of the sorting centre? Answer to the nearest whole number.

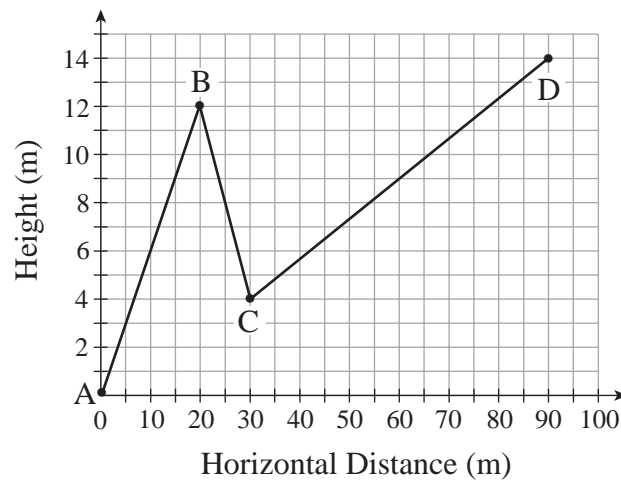
Record your answer neatly on the Answer Sheet.

49. If M is the midpoint of line segment AB , what are the coordinates at point B ?



- A. $(8, 6)$
- B. $(16, 12)$
- C. $(23, 9)$
- D. $(26, 14)$

50. The following graph is a representation of a section of a rollercoaster.



What is the slope of section BC ?

- A. $-\frac{4}{5}$
- B. $-\frac{5}{4}$
- C. $\frac{3}{5}$
- D. $\frac{5}{3}$

51. What is the equation of a line with a slope of $\frac{1}{3}$ and a y-intercept of -2 ?

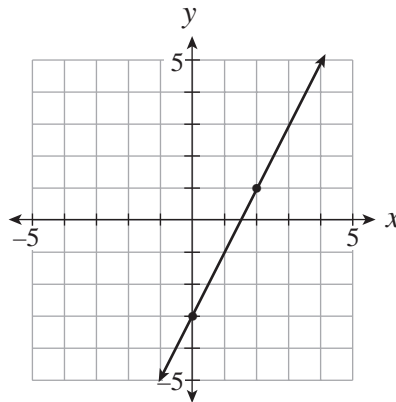
A. $y = -2x + \frac{1}{3}$

B. $y = 2x + \frac{1}{3}$

C. $y = \frac{1}{3}x + 2$

D. $y = \frac{1}{3}x - 2$

52. What is the equation of the line below?



A. $y = 2x - 3$

B. $y = 2x + 3$

C. $y = \frac{1}{2}x - 3$

D. $y = -3x + 2$

53. The maximum recommended heart rate per minute for a 15 year old is 196, while for a 30 year old it is 185. If the maximum heart rate, H , depends on the age, A , what is the equation of the line of best fit?

A. $H = 11A + 15$

B. $H = 181A - 155$

C. $H = -0.73A + 207$

D. $H = -1.36A + 282$

Use the following information to answer questions 54 to 56.

The table below shows the number of oil changes performed on 6 cars compared to the cost of engine repairs in one year.

Number of Oil Changes per Year	3	1	2	6	5	4
Cost of Engine Repairs (\$)	300	700	500	200	300	400

54. The Cost of Engine Repairs depends on the Number of Oil Changes per Year. Using linear regression, what is the line of best fit for this data?
- A. $y = 700x - 85.7$
 - B. $y = -0.90x - 85.7$
 - C. $y = -0.90x + 700$
 - D. $y = -85.7x + 700$
55. Using linear regression, what is the approximate Cost of Engine Repairs if an owner changes the oil 8 times per year?
- A. \$0.00
 - B. \$8.00
 - C. \$14.00
 - D. \$100.00
56. If the correlation coefficient, r , of the data above is -0.90 , which of the following statements best describes the data?
- A. weak positive correlation
 - B. weak negative correlation
 - C. strong positive correlation
 - D. strong negative correlation

Use the following information to answer questions 57 to 59.

The table below compares the price (x) of several vehicles and their fuel economy (y).

Vehicle	Price (US \$)	Highway Fuel Economy (mpg)
Jaguar XK-Series	\$87 330	23
Cadillac CTS	\$33 160	27
Audi A6	\$43 970	26
Pontiac Grand Prix	\$28 735	28
Hyundai Sonata LX	\$22 895	30

57. What is the y -intercept of the line of best fit? Answer to two decimal places.

Record your answer neatly on the Answer Sheet.

58. Approximately what price would you expect to pay for a vehicle with a fuel economy of 24 mpg?

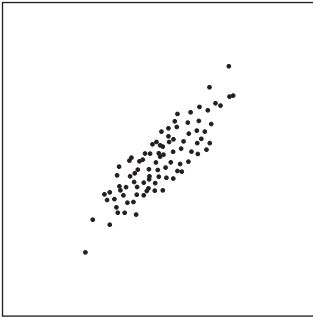
- A. \$90 000
- B. \$82 000
- C. \$79 000
- D. \$73 000

59. What is the correlation coefficient, r , for the vehicle data?

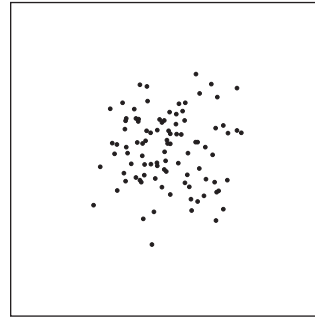
- A. -9.46
- B. -0.94
- C. 0.89
- D. 30.89

60. Which of the following sets of data has the weakest correlation?

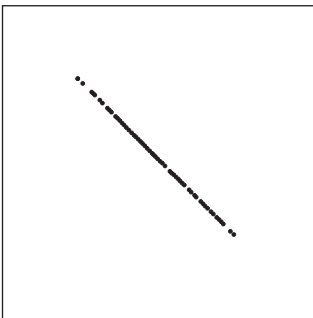
A.



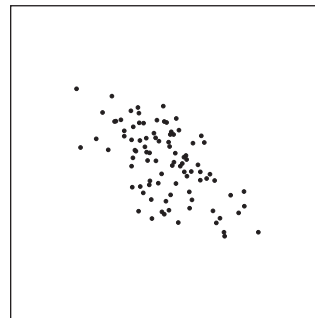
B.



C.



D.



You have **Examination Booklet Form A**. In the box above #1 on your **Answer Sheet**, ensure you filled in the bubble as follows.

Exam Booklet Form/ Cahier d'examen	A	B	C	D	E	F	G	H
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

END OF EXAMINATION

Examination Rules

1. The time allotted for this examination is two hours.
You may, however, take up to 60 minutes of additional time to finish.
2. Answers entered in the Examination Booklet will not be marked.
3. Cheating on an examination will result in a mark of zero. The Ministry of Education considers cheating to have occurred if students break any of the following rules:
 - Students must not be in possession of or have used any secure examination materials prior to the examination session.
 - Students must not communicate with other students during the examination.
 - Students must not give or receive assistance of any kind in answering an examination question during an examination, including allowing one's paper to be viewed by others or copying answers from another student's paper.
 - Students must not possess any book, paper or item that might assist in writing an examination, including a dictionary or piece of electronic equipment, that is not specifically authorized for the examination by ministry policy.
 - Students must not copy, plagiarize or present as one's own, work done by any other person.
 - Students must immediately follow the invigilator's order to stop writing at the end of the examination time and must not alter an Examination Booklet, Response Booklet or Answer Sheet after the invigilator has asked students to hand in examination papers.
 - Students must not remove any piece of the examination materials from the examination room, including work pages.
4. The use of inappropriate language or content may result in a mark of zero being awarded.
5. Upon completion of the examination, return all examination materials to the supervising invigilator.

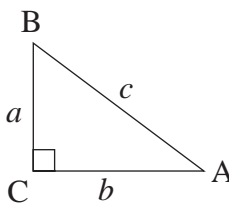
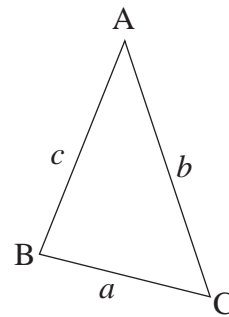
APPLICATIONS OF MATHEMATICS 10

STUDENT REFERENCE

UNIT CONVERSION

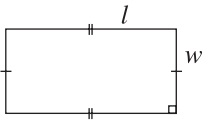
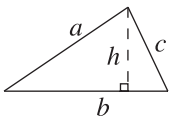
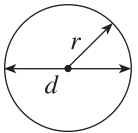
	Common Imperial	Imperial and Metric	Metric
Length	1 mile = 1760 yards 1 mile = 5280 feet 1 yard = 3 feet 1 yard = 36 inches 1 foot = 12 inches	1 mile \approx 1.609 km 1 yard \approx 0.9144 m 1 foot \approx 0.3048 m 1 inch \approx 2.54 cm	1 km = 1000 m 1 m = 100 cm 1 cm = 10 mm
Capacity (Volume)	1 gallon = 4 quarts 1 gallon = 8 pints 1 quart = 2 pints	1 gallon \approx 4.546 L	1 L = 1000 mL 1 mL = 1 cm ³
Mass (Weight)	1 imperial ton = 2000 pounds 1 pound = 16 ounces	1 pound \approx 0.454 kg 1 ounce \approx 28.35 g	1 t = 1000 kg 1 kg = 1000 g

FORMULAE

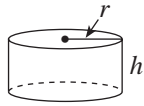
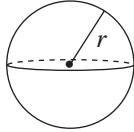
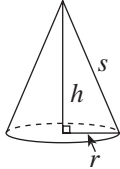
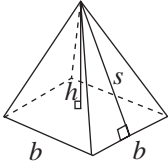
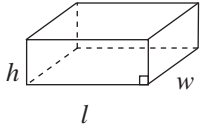
Trigonometry	Other Formulae
<p>(Put your calculator in Degree Mode)</p> <ul style="list-style-type: none"> Right triangles <p>Pythagorean Theorem</p> $a^2 + b^2 = c^2$ $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan A = \frac{\text{opposite}}{\text{adjacent}}$  <ul style="list-style-type: none"> Other triangles, use Sine Law or Cosine Law <p>Law of Sines</p> $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ <p>Law of Cosines</p> $a^2 = b^2 + c^2 - 2bc \cos A$ <p>or $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$</p> 	<ul style="list-style-type: none"> The equation of a line: $y = mx + b$ The slope of a line: $m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$ The distance between two points: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ The midpoint formula: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

GEOMETRIC FORMULAE

Key Legend	
l = length	P = perimeter
w = width	C = circumference
b = base	A = area
h = height	SA = surface area
s = slant height	V = volume
r = radius	
d = diameter	

Geometric Figure	Perimeter	Area
Rectangle 	$P = 2l + 2w$ or $P = 2(l + w)$	$A = lw$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

NOTE: Use the value of π programmed in your calculator rather than the approximation of 3.14.

Geometric Figure	Surface Area	Volume
Cylinder 	$A_{top} = \pi r^2$ $A_{base} = \pi r^2$ $A_{side} = 2\pi rh$ $SA = 2\pi r^2 + 2\pi rh$	$V = \pi r^2 h$
Sphere 	$SA = 4\pi r^2$ or $SA = \pi d^2$	$V = \frac{4}{3}\pi r^3$
Cone 	$A_{side} = \pi rs$ $A_{base} = \pi r^2$ $SA = \pi r^2 + \pi rs$	$V = \frac{1}{3}\pi r^2 h$
Square-Based Pyramid 	$A_{triangle} = \frac{1}{2}bs$ (for each triangle) $A_{base} = b^2$ $SA = 2bs + b^2$	$V = \frac{1}{3}b^2 h$
Rectangular Prism 	$SA = wh + wh + lw + lw + lh + lh$ or $SA = 2(wh + lw + lh)$	$V = lwh$

NOTE: Use the value of π programmed in your calculator rather than the approximation of 3.14.

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

