















2. State two factors that may increase or decrease a homeowner's insurance premium.



3. Describe 2 energy-efficient upgrades that are available to homeowners.

Upgrade	Description
1.	
2.	

4. A home has a portioned assessment of \$160 000 and a frontage of 50 feet. The municipal tax rate is 23.01 mills. The education taxes are \$1171.20. Local sewer improvements are assessed at \$6 per foot. Calculate the total taxes due if the provincial property tax credit is \$750.

The *Statement and Demand for Taxes* on the next page is provided for rough work only. All calculations and answers must appear on **this page**.

## STATEMENT AND DEMAND FOR TAXES

PROPERTY DESCRIPTION							<ul style="list-style-type: none"> <li>ERRORS AND OMISSIONS EXCEPTED</li> <li>ALL LAND IN ARREARS FOR MORE THAN ONE YEAR SHALL BE SOLD FOR TAXES</li> <li>ALL CHEQUES MADE IN CANADIAN FUNDS</li> <li>BANK RECEIPT CONSTITUTES OFFICIAL RECEIPT</li> <li>RETAIN COPY FOR INCOME TAX PURPOSES</li> </ul>	
ROLL NUMBER	WARD	Lot/Section	Blk/Twp.	Plan/Range	Frontage/Area	Dwell. Units		
Civic Address								
Title or Deed No.	Current Assessment Land	Buildings	Status Code	Total Assessment	Prop. Class	Portion %		Total Port Assessment
								ASSESSMENT SUBJECT TO LOCAL IMPROVEMENT LEVY.

<b>MUNICIPAL TAXES</b>	Description			Total Port Assessment	Mill Rate	Levy
	General Municipal					
	By-Law No.	Term	Type	Frontage Levy	Mill Rate	Levy

<b>EDUCATIONAL TAXES</b>	Description			Total Port Assessment	Mill Rate	Levy
	Provincial Education 1 Provincial Education 2 School Division Tax					

<b>PROVINCIAL TAX CREDITS</b>	(See Manitoba Enclosure for Additional Information)	Assessment	Levy
		Manitoba Resident Homeowner Tax Assistance	

TOTAL TAXES DUE							
Municipal Tax	Education Tax	Total Taxes	Prov. Credits	Net Taxes	Arrears/Credits	Added Taxes	Taxes Due

**No marks awarded for work done on this page.  
Provide your answers on p. 4.**

5. Explain why the insurance premium would be lower for tenant's insurance rather than homeowner's insurance for the same property.

6. Explain three types of additional (one-time) costs to consider when initially purchasing a home. Do not include the down payment or mortgage payment.

Additional Cost	Explanation
1.	
2.	
3.	

# Probability

2 Marks

108

7. The probability of Billy scoring a basket is 6 out of 8. State Billy's success rate as a fraction and as a percent.

Fraction: \_\_\_\_\_

Percent: \_\_\_\_\_

8. Jonas is experimenting with pulling blocks out of a bag. There is an equal number of red blocks, yellow blocks, and blue blocks.

A) State the theoretical probability of pulling out a yellow block. (1 mark)

- B) After repeating the experiment several times, Jonas pulled a red block 7 times, a yellow block 3 times, and a blue block 2 times. State the experimental probability of pulling a yellow block. (1 mark)

9. It would cost \$1000 for a contractor to bid on a construction project. There is a one in four chance that she will win the contract. If she is awarded the contract she will be paid \$3000 for the work.
- A) Calculate the expected value. (3 marks)

- B) Justify whether she should bid on the contract based on the expected value calculated in Part A. (1 mark)



10. The weather forecast states that there is a 30% probability of rain for tomorrow. State the odds **against** it raining tomorrow.

11. The manager of a clothing company collects the following sales data for the winter season.

T-shirt colours	Red	Yellow	Green	Blue
Number purchased	111	140	204	145

- A) State the probability that a customer purchased a green T-shirt based on the sales data presented above. (1 mark)

- B) The manager of the store needs to order 9000 T-shirts for next year. State how many green T-shirts the manager should order based on the above sales data. (1 mark)

# Vehicle Finance

2 Marks

116

12. Tyson has a job that requires a vehicle for out-of-town travel. On average, he drives at least 3000 km per month. State one advantage and one disadvantage of leasing a vehicle.

13. Shannon lives in Manitoba and is going to buy her neighbour's car for \$6500. The neighbour is paying for the safety inspection and the lien search. The book value for the car is \$8000. Calculate the total cost to purchase the car after taxes.

14. Bonnie wishes to buy a new vehicle from a Manitoba dealership for \$16 200 before taxes. She has \$5000 saved for a down payment.

A) Calculate the amount Bonnie needs to borrow to purchase the vehicle.  
(2 marks)

B) Bonnie can get a loan for 4 years at 5.5%. Calculate the amount of interest in the first month's payment. (2 marks)

15. A car travels 2400 km and consumes 200 L of fuel. Calculate the fuel economy in L/100 km for the car.

16. Frank has been leasing his pickup truck for the last 3 years. He has made a total of \$16 028 in payments; which included a down payment of \$3500.

Calculate Frank's monthly lease payments.

17. Sam has been involved in a car accident. Explain if this will affect the cost of his Manitoba vehicle insurance.



18. A brand new car costs \$26 800 after taxes. It will depreciate 15% in the first year. Calculate the value of the car after the first year.

19. Sylvie takes her car in for a seasonal maintenance checkup at a Manitoba dealership. In addition to the basic \$60 fee, Sylvie gets an oil change for \$50, and a new set of brake pads for \$80. The mechanic spends 1.5 hours working on the vehicle at a rate of \$90 per hour.

Calculate Sylvie's total bill, after taxes.

# Geometry and Trigonometry

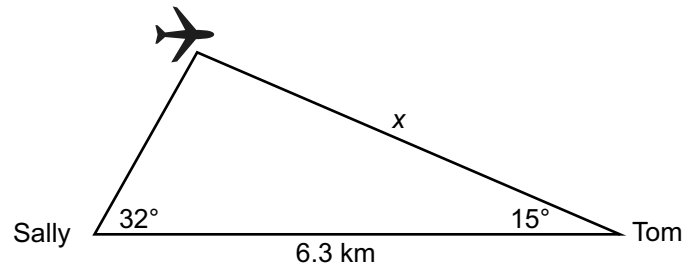
2 Marks

125

20. Determine the number of diagonals in a regular octagon.

Number of diagonals: \_\_\_\_\_

21. Sally spots an airplane in the sky flying away from her at an angle of elevation of  $32^\circ$ . At the same time, Tom who is 6.3 km away from Sally sees the same airplane flying towards him at an angle of elevation of  $15^\circ$ .



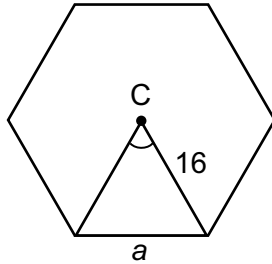
Calculate how far the plane is from Tom.

22. The Cosine Law is often used in construction, commercial, industrial, or artistic applications.

A) Sketch a labelled picture or diagram (not necessarily to scale) that demonstrates where the Cosine Law can be used in the real world. (1 mark)

B) Support your diagram with an explanation of how the Cosine Law was used. (1 mark)

23. Given a regular hexagon with centre C:



- A) Determine the measure of the central angle of the hexagon. (1 mark)

- B) Determine the length of side  $a$ . Justify your response. (2 marks)

24. Polygons are often used in construction, commercial, industrial, or artistic applications.
- Sketch a picture or diagram that demonstrates how properties of polygons are used in the real world. (1 mark)
  - Support your diagram with an explanation of how the properties were used. (1 mark)

25. Looking at his chocolate bar from a top view, Brian states that it looks like a rectangle. State two properties of Brian's chocolate bar that make it a rectangle.



# Precision Measurement

2 Marks

133

26. State an example from the construction, commercial, industrial, or artistic industries where a certain degree of tolerance is required. Support your example with an explanation of how tolerance was required.

27. An odometer is used to measure the distance a car travels. The trip odometer reads 947.2 km. State the precision and uncertainty of the odometer.

Precision: \_\_\_\_\_

Uncertainty: \_\_\_\_\_

28. A metre stick is left outside in the sun and it expands. Explain how this will affect the stick's accuracy and precision.

Accuracy:

Precision:

29. The width of a door frame has a nominal value of 36 inches (which is halfway between the minimum and maximum value). The tolerance is 0.5 inches. State the minimum and maximum values of the width of the door frame.

Maximum: \_\_\_\_\_

Minimum: \_\_\_\_\_

30. A welding company has determined that the desired length of a steel arm is  $12 \text{ cm} \pm 2.5 \text{ cm}$ . The tolerance is given in the form  $\textit{nominal value} \begin{matrix} +\textit{tolerance} \\ -0 \end{matrix}$ . State the nominal value and tolerance.

nominal value: \_\_\_\_\_

tolerance: \_\_\_\_\_

# Statistics

2 Marks

138

31. Given the following scores from a Grade 12 Biology class:

61	80	87	54
40	86	61	68
54	72	54	87

A) State the mean. (1 mark)

139

B) State the mode. (1 mark)

32. Three hundred (300) students wrote a math exam. Craig scored 78% on his math exam. Calculate Craig's percentile ranking, if 204 students received a lower score than him.

33. Jody and Carol play on two different basketball teams. They were both ranked for points scored on their teams.
- Jody ranks in the 90th percentile on her team.
  - Carol ranks in the 75th percentile on her team.

Explain whether it can be determined which player scored more points.



34. Tatiana is enrolled in a law class. The following table shows the average marks she earned and the weight for each category.

Category	Average Mark	Weight
Assignments	90	10%
Tests	65	60%
Final Exam	60	30%

Using a weighted mean, calculate Tatiana's final mark in the course.

35. Calculate the trimmed mean by eliminating the highest and the lowest number for the following set of data.

29	61	87	64
53	90	82	46
70	78	76	73

## Formula Sheet: Essential Mathematics

Name of Formula	Details	Formula
Percentile Rank ( <i>PR</i> )	<i>b</i> = number of raw scores below the given score <i>n</i> = total number of raw scores	$PR = \frac{b}{n} \times 100$
Simple Interest ( <i>I</i> )	<i>P</i> = principal <i>r</i> = annual interest rate <i>t</i> = time in years	$I = Prt$
Gross Debt Service Ratio ( <i>GDSR</i> )		$GDSR = \frac{\text{Monthly mortgage payment} + \text{Monthly property taxes} + \text{Monthly heating costs}}{\text{Gross monthly income}} \times 100$
Fuel Economy in L/100 km ( <i>FE</i> )		$FE = \frac{\text{Fuel used in litres}}{\text{Distance in km}} \times 100$
Expected Value ( <i>EV</i> )	<i>P</i> = probability	$EV = P(\text{win}) \times \$\text{gain} - P(\text{lose}) \times \$\text{loss}$
Sum of Interior Angles of Polygons ( <i>S</i> )	<i>n</i> = number of sides	$S = 180^\circ (n - 2)$
Central Angle of Regular Polygons ( <i>C</i> )	<i>n</i> = number of sides	$C = \frac{360^\circ}{n}$
Number of Diagonals in a Polygon ( <i>D</i> )	<i>n</i> = number of sides	$D = \frac{n(n-3)}{2}$

### Trigonometric Laws

Sine Law	$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$	Cosine Law	$a^2 = b^2 + c^2 - 2bc \cos A$
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### Tax Rates

Federal	Goods and Services Tax (GST)	5%	Provincial	Provincial Sales Tax (PST)	8%
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