

Grade 12
Essential Mathematics
Achievement Test

Marking Guide

June 2019

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Marking Guide. June 2019

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This resource will also be available on the Manitoba Education and Training website at
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Disponible en français.

While the department is committed to making its publications as accessible as possible, some parts of this document are not fully accessible at this time.

Available in alternate formats upon request.

Contents

Marking Guidelines	1
General Marking Instructions	3
Vehicle Finance	6
Precision Measurement	24
Probability	34
Home Finance	46
Geometry and Trigonometry	62
Statistics	78
Appendices	87
Appendix A: Table of Questions by Unit and Learning Outcome	89
Appendix B: Irregularities in Provincial Tests	91
<i>Irregular Test Booklet Report</i>	93
Appendix C: Communications Errors	95



Marking Guidelines

General Marking Instructions

The *Grade 12 Essential Mathematics Achievement Test: Marking Guide (June 2019)* is based on *Grades 9 to 12 Mathematics: Manitoba Curriculum Framework of Outcomes (2014)*.

Please ensure that

- the student booklet number matches the number on the *Scoring Sheet*
- **only a pencil is used to complete the *Scoring Sheet***
- the final test mark is recorded on the *Scoring Sheet*
- the *Scoring Sheet* is complete and a copy has been made for school records

Please make no marks in the student test booklets. If the booklets have marks in them, the marks need to be removed by departmental staff prior to sample marking should the booklet be selected.

Once marking is completed, please forward the *Scoring Sheets* to Manitoba Education and Training using the envelope provided (for more information, see the administration manual).

Marking

The recommended procedure for scoring student responses is as follows:

1. Read the *Marking Guide*.
2. Study the student samples provided and the rationales for the allotted marks.
3. Determine the mark for the student's response by comparing its features with the *Marking Guide* descriptions. The descriptions and samples only typify a student's response to a given question; an exact match is not anticipated.

The marks allocated to questions are based on the concepts associated with the learning outcomes in the curriculum. For each question, shade in the circle on the *Scoring Sheet* that represents the mark awarded based on the concepts. A total of these marks will provide the preliminary mark.

Errors

Marks are deducted if conceptual or communication errors are committed.

Conceptual Errors

As a guiding principle, students should only be penalized once for each error committed in the context of a test question. For example, students may choose an inappropriate strategy for a question, but carry it through correctly and arrive at an incorrect answer. In such cases, students should be penalized for having selected an inappropriate strategy for the task at hand, but should be given credit for having arrived at an answer consistent with their choice of strategy.

Communication Errors

Errors not conceptually related to the learning outcomes associated with the question are called “Communication Errors” (see Appendix C). These errors result in a 0.5 mark deduction. Each type of error can only be deducted once per test and is tracked in a separate section on the *Scoring Sheet*.

When a given response includes multiple types of communication errors, deductions are indicated in the order in which the errors occur in the response. No communication errors are recorded for work that has not been awarded marks. The total deduction may not exceed the marks awarded.

The student’s final mark is determined by subtracting the communication errors from the preliminary mark.

Example:

A student has a preliminary mark of 56. The student committed two E1 errors (0.5 mark deduction) and three E6 errors (0.5 mark deduction).

COMMUNICATION ERRORS/ERREURS DE COMMUNICATION					
Shade in the circles below for a maximum total deduction of 3 marks (0.5 mark deduction per error type). Refer to <i>Marking Guide</i> for details.			Noircir les cercles ci-dessous pour une déduction maximale totale de 3 points (déduction de 0,5 point par type d’erreur). Consulter le <i>Guide de Correction</i> pour plus de détails.		
E1 <input checked="" type="radio"/>	E2 <input type="radio"/>	E3 <input type="radio"/>	E4 <input type="radio"/>	E5 <input type="radio"/>	E6 <input checked="" type="radio"/>
Final Answer/ Réponse finale	Notation	Transcription/ Transposition	Whole Units/ Unités entières	Units/ Unités	Rounding/ Arrondissement

Test mark / Note au test :	56	–	1	=	55
	Preliminary Mark Note préliminaire		Communication Errors (maximum 3 marks) Erreurs de communication (maximum 3 points)		76

Marking Guidelines

Table Values

One mark will be awarded to a student that circles the correct value in a given table. In other words, this will be considered the equivalent of the student writing the correct value in the space provided.

Follow-through errors

Generally, a student will not be penalized more than once for the same error. A final answer will be deemed to be correct if it follows correctly from an incorrect intermediate step where marks were already lost. In multiple-part questions, if an error was made in Part A, but subsequent parts were completed appropriately based on the incorrect information in Part A, full marks will be awarded in subsequent parts.

Marks for follow-through errors will not be awarded if

- the answer is wrong and there are no part-mark increments available
- the error is conceptual in nature (e.g., the student used the simple Cosine ratio when the question called for the use of the Cosine Law)

Additional-information errors

Students can occasionally provide too much information in their answers. When additional information is provided, it must be clearly indicated as such. For example, if a student is asked to calculate a probability, then full marks are awarded for a correct answer even if the odds are also present—provided this additional information is labelled “odds.”

Irregularities in Provincial Tests

During the administration of provincial tests, supervising teachers may encounter irregularities. Markers may also encounter irregularities during local marking sessions. The appendix provides examples of such irregularities as well as procedures to follow to report irregularities.

If a *Scoring Sheet* is marked with “0” only (e.g., student was present but did not attempt any questions) please document this on the *Irregular Test Booklet Report*.

Assistance

If any issue arises that cannot be resolved locally during marking, please call Manitoba Education and Training at the earliest opportunity to advise us of the situation and seek assistance if necessary.

You must contact the person responsible for this project before making any modifications to the marking keys.

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Grade 12 Essential Mathematics
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Vehicle Finance

Question 1

E5.V.1

2 marks

Marjorie borrows \$18 000 to finance the purchase of a car. She makes monthly car payments of \$325 for 6 years.

Calculate the total finance charge (interest) she will pay for the loan. (2 marks)

Answer:

Total amount paid: $\$325 \times 6 \times 12$

$= \$23\,400$

← 1 mark

Finance charge: $\$23\,400 - \$18\,000$

$= \$5400$

← 1 mark

Exemplar 1

(2 marks)

$$325 \times 1.13 = 367.25 \times 12 = 4407 \times 6 = 26442$$

Mark: 0 out of 2

Rationale: Incorrect total amount paid
Incorrect finance charge

Exemplar 2

(2 marks)

$$6 \times 12 = 72 \quad 325 \times 72 = \$23400$$

$\$23400$

Mark: 1 out of 2

Rationale: Correct total amount paid (1 mark)
No calculation of finance charge

Exemplar 3

(2 marks)

$$\$325 \times 12 \times 6 = \$23,400 + 18,000 = \$41,400$$

Mark: 1 out of 2

Rationale: Correct total amount paid (1 mark)
Incorrect finance charge

Question 2

E5.V.1

3 marks

Maria is buying a new vehicle. After making a down payment to the dealership, Maria finances the remaining balance through her bank. The table below shows the details of the purchase.

Vehicle price	\$29 000
Down payment	\$8000
Total tax	\$3770
Finance charge (interest)	\$2386
Term	48 months

A) Calculate the total amount that will be paid to the bank. (2 marks)

Answer:

$$\begin{aligned}\text{Amount after down payment: } & \$29\,000 - \$8000 \\ & = \$21\,000 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

$$\begin{aligned}\text{Total amount paid: } & \$21\,000 + \$3770 + \$2386 \\ & = \$27\,156 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

B) Calculate Maria's monthly payment. (1 mark)

Answer:

$$\begin{aligned}\text{Monthly payment: } & \frac{\$27\,156}{48} \\ & = \$565.75 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

Exemplar 1

(3 marks)

A) $29,000 - 8,000 = \$21,000$

B) $\frac{21,000}{48} = 437.50$

E5

Mark: 2 out of 3**Rationale:** Correct amount after down payment in Part A (1 mark)

Incorrect total paid in Part A

Correct answer in Part B (follow-through error) (1 mark)

E5 (does not include units in final answer)

Exemplar 2

(3 marks)

A) $\begin{array}{r} 21000 \\ + 3770 \\ \hline 24770 \end{array}$

E5

B)

$$\begin{array}{r} 24770 \\ + 2386 \\ \hline 27156 \\ \div 48 \\ \hline 565.75 \end{array}$$

E1

The monthly payment
would have been \$565.75

Mark: 3 out of 3**Rationale:** Correct amount after down payment in Part A (1 mark)

Correct total paid in Part A (1 mark)

E1 (answer is presented in another part of the question)

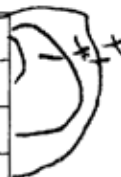
E5 (does not include units in final answer)

Correct answer in Part B (1 mark)

Exemplar 3

(3 marks)

Vehicle price	\$29 000
Down payment	\$8000
Total Tax	\$3770
Finance charge (interest)	\$2386
Term	48 months



- A) \$27,156 is the amount paid
- B) $27,156 \div 48 = \$565.75$

Mark: 3 out of 3

Rationale: Correct amount after down payment in Part A (1 mark)
Correct total paid in Part A (1 mark)
Correct answer in Part B (1 mark)



Question 3

E5.V.1

1 mark

Explain one advantage of financing the purchase of a new car rather than leasing it.

Sample Answers:

- you may use the car for collateral
- you will have something of value at the end of the term (can sell car)
- the total cost of the car will be less than the cost of leasing and buying it out in the end
- there is no limit on kilometres driven

Note to marker: Do not accept “cheaper” without further explanation.

Exemplar 1

(1 mark)

It is better to buy a new car than
leasing because you will get the car immediately.
In leasing you a maximum km that you need
to follow or else you'll pay for it.

Mark: 0 out of 1**Rationale:** Incorrect response (getting car immediately)**Exemplar 2**

(1 mark)

no limits on driving

Mark: 1 out of 1**Rationale:** Correct response (1 mark)

Question 4

E5.V.1

3 marks

Luc purchases a used vehicle privately. The vehicle costs \$12 000 and has a book value of \$10 000. He also pays \$50 for a safety inspection.

Calculate the total amount Luc will pay for the vehicle, after taxes. (3 marks)

Answer:

$$\begin{aligned}\text{Vehicle: } & 1.08 \times \$12\,000 \\ & = \$12\,960 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

$$\begin{aligned}\text{Safety inspection: } & 1.05 \times \$50 \\ & = \$52.50 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

$$\begin{aligned}\text{Total: } & \$12\,960 + \$52.50 \\ & = \$13\,012.50 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

Exemplar 1

(3 marks)

$$\begin{array}{r} \$10,000 \times 0.08 \\ = \$800 \\ \$12,000 \\ \$50 \\ + \$800 \\ \hline \$12,850 \end{array}$$

Mark: 1 out of 3

Rationale: Incorrect tax on vehicle
Incorrect tax on safety inspection
Correct final answer (follow-through error) (1 mark)

Exemplar 2

(3 marks)

$$\begin{array}{l} \text{Vehicle} = 12000 \\ \text{Piston Book} = 800 \\ \text{Safety} = 50 \times .05 = \$2.50 + \$50 \\ = \$52.50 \\ 12000 \times .08 = 960 + 12000 = \$12960 \\ + \$52.50 \\ + 800 \\ \hline \boxed{\$13812.50} \end{array}$$

Mark: 2 out of 3

Rationale: Incorrect tax on vehicle (calculates PST on both the book value and the selling price)
Correct tax on safety inspection (1 mark)
Correct final answer (follow-through error) (1 mark)

Exemplar 3

(3 marks)

$$1.08(12,000 + 50) = \$13014.00$$

Mark: 2 out of 3

Rationale: Correct tax on vehicle (1 mark)
Incorrect tax on safety inspection
Correct final answer (follow-through error) (1 mark)

Question 5

E5.V.1

1 mark

State one factor that affects your car insurance premium.

Sample Answers:

- the type of vehicle
- the type of insurance
- the amount of third party liability insurance
- where you live
- your driving record

Exemplar 1

(1 mark)

Whether you are a boy or girl.

Mark: 0 out of 1**Rationale:** Incorrect response**Exemplar 2**

(1 mark)

What age you are (16-25 generally more)

Mark: 0 out of 1**Rationale:** Insufficient response**Exemplar 3**

(1 mark)

Accidents

Mark: 0 out of 1**Rationale:** Insufficient response

Question 6

E5.V.1

2 marks

You decide to buy the car you have been leasing for the past 3 years. The car had a sticker price of \$32 000, before taxes. The residual value is 40% of the sticker price.

Calculate the residual value of the car, after taxes. (2 marks)

Answer:

$$\begin{aligned}\text{Residual value: } \$32\,000 \times 0.40 \times 1.13 & \leftarrow 1 \text{ mark for process} \\ = \$14\,464 & \leftarrow 1 \text{ mark}\end{aligned}$$

OR**Answer:**

$$\begin{aligned}\text{Residual value before taxes: } \$32\,000 \times 0.40 \\ = \$12\,800 & \leftarrow 1 \text{ mark} \\ \text{Residual value after taxes: } \$12\,800 \times 1.13 \\ = \$14\,464 & \leftarrow 1 \text{ mark}\end{aligned}$$

OR**Answer:**

$$\begin{aligned}\text{Tax: } \$32\,000 \times 0.40 \times 0.13 \\ = \$1664 & \leftarrow 1 \text{ mark} \\ \text{Residual value after taxes: } (\$32\,000 \times 0.40) + \$1664 \\ = \$12\,800 + \$1664 \\ = \$14\,464 & \leftarrow 1 \text{ mark}\end{aligned}$$

Exemplar 1

(2 marks)

$$32,000 (0.13) = \$4,160$$

$$4,160 (0.40) = \$1,664 \text{ residual value}$$

$$\begin{array}{r} 4,160 \\ 32,000 \\ \hline \$36,160 \end{array}$$

Mark: 0 out of 2**Rationale:** Incorrect residual value
Incorrect final answer**Exemplar 2**

(2 marks)

$$32,000 \div 0.40 = 128,000 \times 0.13$$
$$= 16,640$$

$$= \$33,664$$

Mark: 1 out of 2**Rationale:** Correct residual value (1 mark)
Incorrect final answer**Exemplar 3**

(2 marks)

$$32,000 \times 0.4 = 12,800 \times 1.13 = 14,464$$

$$14,464 \times 12 \times 3 = 520,704$$

Mark: 1 out of 2**Rationale:** Correct process (1 mark)
Incorrect final answer

Question 7

E5.V.1

3 marks

Juanita buys a new compact car. She is responsible for the following operating costs.

Operating Costs	
Cost per kilometre	\$0.126/km
Monthly car payment	\$350

Juanita drives 15 000 km per year.

Calculate the annual operating costs of the car, before taxes. (3 marks)

Answer:

$$\begin{aligned}\text{Cost per kilometre: } 15\,000 \text{ km} \times \$0.126/\text{km} \\ = \$1890 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

$$\begin{aligned}\text{Annual payment: } \$350 \times 12 \\ = \$4200 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

$$\begin{aligned}\text{Annual operating costs: } \$1890 + \$4200 \\ = \$6090 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

Note to marker: Award one mark for a follow-through error only if one of the two costs have been calculated correctly.

Exemplar 1

(3 marks)

$$15000 \times 0.126 = 1890$$

$$1890 + 350 = 2240$$

E5

Mark: 2 out of 3**Rationale:** Correct cost per kilometre (1 mark)

Incorrect annual payment

Correct final answer (follow-through error) (1 mark)

E5 (does not include units in final answer)

Exemplar 2

(3 marks)

Compact car

$$15,000(0.126) = \$1890$$

$$\$350 \times 12 = \$4,200 \text{ (annually)}$$

Mark: 2 out of 3**Rationale:** Correct cost per kilometre (1 mark)

Correct annual payment (1 mark)

No calculation of final answer

Question 8

E5.V.1

2 marks

Jafar owns a truck and a hybrid car. The fuel economy of the truck is 9.4 L/100 km. The fuel economy of the car is 3.5 L/100 km. Jafar drove his truck 17 000 km last year.

Calculate how much less fuel he would have used if he had driven his hybrid car instead of his truck. (2 marks)

Answer:

$$\begin{aligned}\text{Difference in L/100 km: } & 9.4 \text{ L/100 km} - 3.5 \text{ L/100 km} \\ & = 5.9 \text{ L/100 km}\end{aligned}$$

← 1 mark

$$\begin{aligned}\text{Difference in litres: } & \frac{5.9 \text{ L}}{100 \text{ km}} = \frac{x}{17\,000 \text{ km}} \\ & x = 1003 \text{ L}\end{aligned}$$

← 1 mark

OR**Answer:**

Litres used per 17 000 km:

$$\begin{aligned}\text{Car: } & \frac{3.5 \text{ L}}{100 \text{ km}} = \frac{x}{17\,000 \text{ km}} \\ & x = 595 \text{ L}\end{aligned}$$

$$\begin{aligned}\text{Truck: } & \frac{9.4 \text{ L}}{100 \text{ km}} = \frac{x}{17\,000 \text{ km}} \\ & x = 1598 \text{ L}\end{aligned}$$

← 1 mark for process

$$\begin{aligned}\text{Difference in litres: } & 1598 \text{ L} - 595 \text{ L} \\ & = 1003 \text{ L}\end{aligned}$$

← 1 mark

Exemplar 1

(2 marks)

$$FE = \frac{3.5}{17000} \times 100 = 0.02$$

$$FE = \frac{9.4}{17000} \times 100 = 0.055$$

Mark: 0 out of 2

Rationale: Incorrect process
Incorrect final answer

Exemplar 2

(2 marks)

$$3.5 \div 1000 \times 17000 = 59.5$$

$$9.4 \div 1000 \times 17000 = 159.8$$

100.3 L less

Mark: 1 out of 2

Rationale: Incorrect process
Correct final answer (follow-through error) (1 mark)

Exemplar 3

(2 marks)

$$0.094 \times 17000 =$$

1598 L

Mark: 1 out of 2

Rationale: Correct process (litres used by the truck) (1 mark)
Incorrect final answer

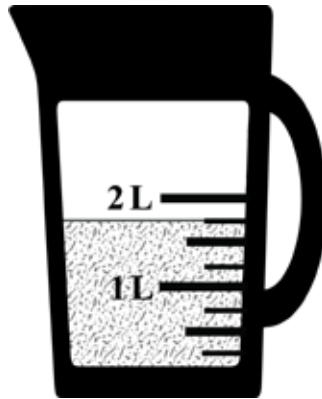
Precision Measurement

Question 9

E5.P.1

2 marks

Colette is mixing iced tea in the jug shown below.



State the amount of iced tea in the jug in the form: measurement \pm uncertainty
(2 marks)

Answer:

Uncertainty: $0.25 \text{ L} \div 2$
 $= 0.125 \text{ L}$

$\underbrace{1.75 \text{ L}}_{1 \text{ mark}} \pm \underbrace{0.125 \text{ L}}_{1 \text{ mark}}$

Exemplar 1

(2 marks)

Uncertainty \rightarrow + or - 125mL

Amount = $1.625\text{ L} \pm 1.875\text{ L}$

Mark: 0 out of 2**Rationale:** Incorrect measurement

Incorrect uncertainty (contradictory information)

Exemplar 2

(2 marks)

$1.8 \pm 0.2\text{ L}$

$1.8 + 0.2 = 2\text{ L}$

$1.8 - 0.2 = 1.6\text{ L}$

Mark: 0 out of 2**Rationale:** Incorrect measurement

Incorrect uncertainty

Exemplar 3

(2 marks)

$1.75\text{ L} \pm .25\text{ L}$

Mark: 1 out of 2**Rationale:** Correct measurement (1 mark)

Incorrect uncertainty

Question 10

E5.P.1

1 mark

Pierre is a competitive swimmer. He finished a race with a time of 28.17 seconds.

State the precision of the measurement.

Answer:

0.01 second

Exemplar 1

(1 mark)

Nearest hundredth of a second

0.00.00

Mark: 1 out of 1

Rationale: Correct answer (1 mark)

Exemplar 2

(1 mark)

. 0 \ E5

Mark: 1 out of 1

Rationale: Correct answer (1 mark)

E5 (does not include units in final answer)

Question 11

E5.P.1

1 mark

Kenneth wants to build a shelf with a width of $59 \text{ cm} \pm 0.02 \text{ cm}$.

State the maximum acceptable width of the shelf.

Answer:

$$\begin{aligned}\text{Maximum width: } & 59 + 0.02 \\ & = 59.02 \text{ cm}\end{aligned}$$

 \leftarrow 1 mark

Exemplar 1

(1 mark)

 59.2 cm **Mark: 0 out of 1****Rationale:** Incorrect answer**Exemplar 2**

(1 mark)

 $59.2 \pm 0.02\text{ cm}$ 61 cm **Mark: 0 out of 1****Rationale:** Incorrect answer**Exemplar 3**

(1 mark)

 $58.98 - 59.02$ $\text{max } 59.02$ E5**Mark: 1 out of 1****Rationale:** Correct answer (1 mark)

E5 (does not include units in final answer)

Question 12

E5.P.1

1 mark

Choose the letter that best completes the statement below.

The range of acceptable measurements refers to:

- A) the maximum
- B) the minimum
- C) the precision
- D) the tolerance

Answer: D)

Question 13

E5.P.1

1 mark

The uncertainty of a scale is 0.25 g.

State the precision of the scale.

Answer:

0.5 g

Question 14

E5.P.1

2 marks

The uncertainty for the speedometer of a vehicle is 5% of the speedometer's reading.

Calculate the minimum speed a vehicle could be travelling if its speedometer reads 60 km/h.
(2 marks)

Answer:

$$\left. \begin{array}{l} \text{Uncertainty: } 0.05 \times 60 \text{ km/h} \\ \qquad \qquad \qquad = 3 \text{ km/h} \end{array} \right\} \quad \leftarrow 1 \text{ mark for process}$$

$$\begin{array}{l} \text{Minimum speed: } 60 \text{ km/h} - 3 \text{ km/h} \\ \qquad \qquad \qquad = 57 \text{ km/h} \end{array} \quad \leftarrow 1 \text{ mark}$$

Exemplar 1

(2 marks)

$$60 \times 0.025 = 1.5$$

E5

$$60 - 1.5 = 58.5$$

Mark: 1 out of 2**Rationale:** Incorrect uncertainty

Correct final answer (follow-through error) (1 mark)

E5 (does not include units in final answer)

Exemplar 2

(2 marks)

$$60 \times 0.05 = 3 \text{ km/h}$$

Mark: 1 out of 2**Rationale:** Correct uncertainty (1 mark)**Exemplar 3**

(2 marks)

$$57 \text{ km/h}$$

Mark: 1 out of 2**Rationale:** No calculation of uncertainty shown

Correct final answer (1 mark)

Probability

Question 15

E6.P.1

4 marks

Colin has a painting company. He advertises by delivering brochures. Each brochure costs him \$2.50 to print. He finds that 1 out of 50 brochures results in a painting job where he earns \$100.

A) Calculate the expected value of each brochure. (3 marks)

Answer:

$$\text{\$gain: } \$100 - \$2.50 = \$97.50$$

$$\text{\$loss: } \$2.50$$

$$EV = P(\text{win}) \times \text{\$gain} - P(\text{lose}) \times \text{\$loss}$$

$$= \underbrace{\left(\frac{1}{50}\right)(\$97.50)}_{1 \text{ mark}} - \underbrace{\left(\frac{49}{50}\right)(\$2.50)}_{1 \text{ mark}}$$

$$= \$1.95 - \$2.45$$

$$= -\$0.50 \quad \leftarrow 1 \text{ mark}$$

OR

Answer:

$$\text{Average earnings: } (0.02)(\$100) \quad \leftarrow 1 \text{ mark for process}$$

$$= \$2.00 \quad \leftarrow 1 \text{ mark}$$

$$\text{Expected value: } \$2.00 - \$2.50$$

$$= -\$0.50 \quad \leftarrow 1 \text{ mark}$$

Note to marker: Award one mark for a follow-through error only if two correct values have been used in the process.

B) Justify whether Colin should continue to deliver brochures based on your answer in Part A. (1 mark)

Answer:

No, the expected value is negative so Colin is losing money.

Exemplar 1

(4 marks)

- A) $\left(\frac{49}{50} \times \$100\right) - \frac{1}{50}(\$2.50) = \$0.05$
 $98 - 0.05 = \$97.95$
- B) I think that Colin should continue to deliver brochures.

Mark: 1 out of 4

Rationale: Incorrect $P(\text{win}) \times \$\text{gain}$ in Part A
Incorrect $P(\text{lose}) \times \$\text{loss}$ in Part A
Correct final answer in Part A (follow-through error) (1 mark)
Insufficient response in Part B

Exemplar 2

(4 marks)

- A) $EV = (P_{\text{win}} \times \text{winning}) - \text{cost}$
 $EV = \left(\frac{1}{50} \times 100\right) - 2.50$
 $2 - 2.50$
 $= -0.50$
EV is negative, he shouldn't be in that business
- B) Colin should not deliver the brochures because it won't end up making him money. He'll just keep piling up on debt

Mark: 3 out of 4

Rationale: Correct average earnings in Part A (2 marks)
Incorrect final answer in Part A
Correct response in Part B (1 mark)

Exemplar 3

(4 marks)

A) $\$100 \text{ per job} \times 1 \text{ out of } 50$
 $100 \div 50 = \$2.00 \text{ value per brochure}$

B) income = $\$2.00 \text{ per brochure}$
expense = $\$2.50 \text{ per brochure}$

E1

Negative 50% so no he should stop sending them

Mark: 4 out of 4

Rationale: Correct answer in Part A (3 marks)

E1 (answer presented in another part of the question)

Correct response in Part B (1 mark)



Question 16

E6.P.1

2 marks

The odds **against** breaking your pencil lead are 323 : 7.

A) State the odds in favour of breaking your pencil lead. (1 mark)

Answer:

7 : 323 or 7 to 323

B) State the probability of breaking your pencil lead. (1 mark)

Answer:

$\frac{7}{330}$ or 0.02 or 2.12% or seven out of three hundred thirty or 7 : 330

Note to marker: Accept equivalent representations.

Exemplar 1

(2 marks)

A) $\frac{7}{323} = 2.17\%$

B) $\frac{7}{330} = 1.21\%$

Mark: 0 out of 2**Rationale:** Incorrect answer in Part A

Incorrect answer in Part B

Exemplar 2

(2 marks)

A) odds in favour

favourable outcomes: unfavourable outcomes

$$7 : 323$$

B) Probability = $\frac{7}{323}$

Mark: 1 out of 2**Rationale:** Correct answer in Part A (1 mark)

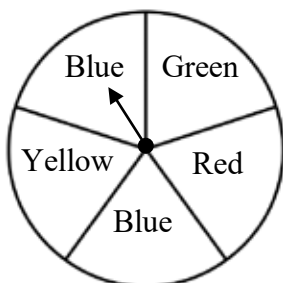
Incorrect answer in Part B

Question 17

E6.P.1

1 mark

Arielle spins the following spinner. The spinner is divided into equal sections.



State the probability of the spinner landing on blue.

Answer:

$\frac{2}{5}$ or 0.4 or 40% or two out of five or 2 : 5

Note to marker: Accept equivalent representations.



Question 18

E6.P.1

2 marks

Wooden blocks numbered 1 through 10 are placed in a bag. The blocks are all the same size and shape. Your teacher pulls out one block, records the number, and puts the block back in the bag. She repeats this process nine more times.



Her results are recorded below.

10 6 5 6 4 10 4 5 8 4

- A) A student states that the experimental probability and the theoretical probability of pulling Block 4 are the same.

Explain why he is incorrect. (1 mark)

Sample Answers:

- The experimental probability is 30% and the theoretical probability is 10%.
- Theoretically each block should be pulled once. Block 4 was pulled more than once.

- B) State which block has the same experimental and theoretical probability of being pulled. (1 mark)

Answer:

Block 8

Exemplar 1

(2 marks)

- A) Experimentally she has pulled $4 \frac{3}{10}$ times
theoretically she will pull $4 \frac{1}{10}$ times
- B) 0 ? (zero)

Mark: 1 out of 2**Rationale:** Correct response in Part A (1 mark)

Incorrect answer in Part B

Exemplar 2

(2 marks)

- A) Because you only have a 1 in 10 chance
of pulling a 4, it never changes
- B) 8

Mark: 1 out of 2**Rationale:** Incorrect response in Part A

Correct answer in Part B (1 mark)

Exemplar 3

(2 marks)

- A) because theoretically there are 10 blocks
in the bag so in theory she would
of pulled out every number from 1-10
How ever she pulled out more than one
4
- B) 8

Mark: 2 out of 2**Rationale:** Correct response in Part A (1 mark)

Correct answer in Part B (1 mark)

Question 19

E6.P.1

1 mark

Emmanuel has two cubes with faces numbered 1 through 6; one red and one blue. The two cubes are rolled.

The chart below shows the numbers on each cube and the possible sums.

		Blue Cube					
		1	2	3	4	5	6
Red Cube	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

State the probability of the two cubes having a sum greater than 8.

Answer:

$\frac{10}{36}$ or 0.28 or 27.78% or ten out of thirty-six or 10 : 36

Note to marker: Accept equivalent representations.

Exemplar 1

(1 mark)

$$\frac{10}{36} \text{ or } \frac{5}{18}$$

Mark: 1 out of 1**Rationale:** Correct answer (1 mark)

Home Finance

Question 20

E6.H.1

4 marks

Mr. Reid wants to buy a house for \$260 000. His monthly mortgage payment would be \$1524. The property taxes are \$2220 annually, and the heating costs are \$195 monthly. Mr. Reid's gross monthly income is \$5125.

A) Calculate Mr. Reid's Gross Debt Service Ratio as a percent. (3 marks)

Answer:

$$\begin{aligned}\text{Property Taxes: } \$2220 \div 12 \\ = \$185\end{aligned}$$

$$\begin{aligned}GDSR &= \frac{(\$1524 + \$185 + \$195)}{\$5125} \\ &= \frac{1904}{5125} \\ &= 0.371\,51\dots \times 100 \\ &= 37.15\% \quad \leftarrow 1 \text{ mark}\end{aligned}$$

$\left\{ \begin{array}{l} \text{No mark for 1 correct substitution} \\ \textbf{or} \\ \text{1 mark for 2 or 3 correct substitutions} \\ \textbf{or} \\ \text{2 marks for all correct substitutions} \end{array} \right.$

B) Explain whether Mr. Reid will be approved for the mortgage. (1 mark)

Answer:

No, Mr. Reid's GDSR is greater than 32%.

Exemplar 1

(4 marks)

A)
$$\frac{1524 + 2220 + 195}{5125} \times 100 = 77\% \quad \boxed{\text{E6}}$$

B) No, his percentage is well over 32%.

Mark: 3 out of 4**Rationale:** Three correct substitutions in Part A (1 mark)

Correct final answer in Part A (follow-through error) (1 mark)

E6 (does not express the answer to the appropriate number of decimal places)

Correct response in Part B (follow-through error) (1 mark)

Exemplar 2

(4 marks)

A)
$$\frac{1524 + 185 + 195}{5105} \times 100 = 48.8\%$$

B) No he will not get it because his gds is higher than 32%.

Mark: 3 out of 4**Rationale:** Correct substitutions in Part A (2 marks)

Incorrect final answer in Part A

Correct response in Part B (follow-through error) (1 mark)

Exemplar 3

(4 marks)

A)
$$\frac{2220}{12} = 185 \quad \frac{1524 + 185 + 195}{5125} = 37.2\% \quad \boxed{\text{E6}}$$

B) Mr Reid would not be approved

Mark: 3 out of 4**Rationale:** Correct substitutions in Part A (2 marks)

Correct final answer in Part A (1 mark)

E6 (does not express the answer to the appropriate number of decimal places)

Insufficient response in Part B

Question 21

E6.H.1

2 marks

Describe the purpose of the following one-time costs that are associated with buying a house.

A) Lawyer Fees (1 mark)

Sample Answer:

A lawyer must notarize all legal documents, such as the land transfer certificate.

B) Home Inspection (1 mark)

Sample Answer:

An inspection helps to make you aware of potential issues with the house.

Exemplar 1

(2 marks)

- A) A lawyer fee is given to a professional lawyer for their help. This can prevent you from buying a house you can afford. Their advice can save you from going into debt.
- B) A home inspection is to look throughout the house and see any current damage or possible future damage. This can save you from buying a house that will need to be fixed very often.

Mark: 1 out of 2**Rationale:** Incorrect response in Part A

Correct response in Part B (1 mark)

Exemplar 2

(2 marks)

- A) to have any legal issues dealt with
- B) to see what house needs

Mark: 1 out of 2**Rationale:** Correct response in Part A (1 mark)

Insufficient response in Part B

Exemplar 3

(2 marks)

- A) any legal documents that need scrutiny in order to sign properly need a lawyer.
- B) Any damages that need looking for to bring to light. or done so by an inspection

Mark: 2 out of 2**Rationale:** Correct response in Part A (1 mark)

Correct response in Part B (1 mark)



Question 22

E6.H.1

1 mark

Myra owns a house. Even though her old furnace works, Myra replaces it with a new, more efficient furnace.

Justify why Myra made this decision.

Sample Answers:

- to reduce monthly heating costs
- to increase the resale value of the property

Exemplar 1

(1 mark)

Saves money.

Mark: 0 out of 1**Rationale:** Insufficient response**Exemplar 2**

(1 mark)

To reduce her carbon
foot print.

Mark: 1 out of 1**Rationale:** Correct response (1 mark)**Exemplar 3**

(1 mark)

Adds money to the home and new owners
won't need to replace it.

Mark: 1 out of 1**Rationale:** Correct response (1 mark)

Question 23

E6.H.1

1 mark

Adelynn is purchasing a home insurance policy for her house.

Justify why she should choose a comprehensive policy rather than a standard policy.

Answer:

She should choose a comprehensive policy because it covers more potential damages.

Exemplar 1

(1 mark)

Because it's top quality insurance.

Mark: 0 out of 1**Rationale:** Insufficient response**Exemplar 2**

(1 mark)

To protect all of his things.

Mark: 0 out of 1**Rationale:** Insufficient response**Exemplar 3**

(1 mark)

This covers a wider range of more expensive belongings.

Mark: 1 out of 1**Rationale:** Correct response (1 mark)

Question 24

E6.H.1

3 marks

Rypin has just purchased a house. He has a mortgage with an interest rate of 3.5% and an opening balance of \$98 000.

A) Calculate the interest on his first monthly mortgage payment. (2 marks)

Answer:

$$I = Prt$$

$$= \$98\,000 \times 0.035 \times \frac{1}{12} \quad \leftarrow 1 \text{ mark for all correct substitutions}$$

$$= \$285.83 \quad \leftarrow 1 \text{ mark}$$

Note to marker: Award the second mark for a follow-through error only if two of three correct substitutions are made.

B) Rypin's monthly mortgage payment is \$875.90.

Calculate how much of his first month's payment will go towards the unpaid balance.
(1 mark)

Answer:

$$\$875.90 - \$285.83$$

$$= \$590.07 \quad \leftarrow 1 \text{ mark}$$

Exemplar 1

(3 marks)

A) $\frac{3.5 \times 98000}{12} = \28583.33

B)

Mark: 1 out of 3

Rationale: Incorrect substitutions in Part A

Correct answer in Part A (follow-through error) (1 mark)

No answer in Part B

Exemplar 2

(3 marks)

A) $\frac{98000}{1000} \times 3.5$

$= 343$

B) $875.90 - 343 = 532.90$ E5

Mark: 1 out of 3

Rationale: Incorrect answer in Part A

Correct answer in Part B (follow-through error) (1 mark)

E5 (does not include units in final answer)

Exemplar 3

(3 marks)

A) $98000 \div 100 = 980$
 $3.5 \times 980 = 3430$
 $\$3430 \div 12 = 285.83$

B) $875.9 - 285.83 = 590.0667$ E5

Mark: 2 out of 3

Rationale: Correct answer in Part A (2 marks)

E5 (does not include units in final answer)

Incorrect answer in Part B

Question 25

E6.H.1

2 marks

Jasmine bought a house for \$225 000. She already knows that for the first \$200 000, the land transfer tax will cost \$1650.

Calculate the total land transfer tax. (2 marks)

Land Transfer Tax Table	
Value of Property	Rate
On the first \$30 000	0%
On the next \$60 000 (i.e., \$30 001 to \$90 000)	0.5%
On the next \$60 000 (i.e., \$90 001 to \$150 000)	1.0%
On the next \$50 000 (i.e., \$150 001 to \$200 000)	1.5%
On amounts in excess of \$200 000	2.0%

Answer:

First \$200 000: \$1650

$$\$225\,000 - \$200\,000 = \$25\,000$$

$$\begin{aligned}\text{Next } \$25\,000: & 0.02 \times \$25\,000 \\ & = \$500\end{aligned}$$

← 1 mark for process

$$\begin{aligned}\text{Total land transfer tax: } & \$1650 + \$500 \\ & = \$2150\end{aligned}$$

← 1 mark

Exemplar 1

(2 marks)

$$200000 = \$1650$$

$$25000 \times 0.015 = \$375$$

$$1650 + 375 = \$2025$$

Mark: 1 out of 2**Rationale:** Incorrect amount on next \$25 000

Correct answer (follow-through error) (1 mark)

Exemplar 2

(2 marks)

$$.0 (30000) = 0$$

$$.005 (60000) = 300$$

$$.01 (60000) = 600$$

$$.15 (50000) = 750$$

$$.02 (25000) = 500$$

$$\underline{\$2150} + 1650$$

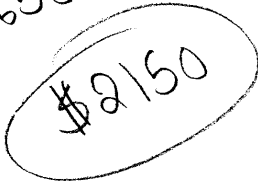
$$= \$3800$$

Mark: 1 out of 2**Rationale:** Correct amount on next \$25 000 (1 mark)

Incorrect final answer

Exemplar 3

(2 marks)

$$1650 + 500$$

$$\$2150$$

Mark: 2 out of 2**Rationale:** Correct answer (2 marks)

Question 26

E6.H.1

1 mark

Choose the letter that best completes the statement below.

The item that is **not** an ongoing home maintenance task is:

- A) checking for leaky faucets
- B) ensuring that the furnace is functioning
- C) replacing a shattered window
- D) checking hot water tank for leaks

Answer: C)



Geometry and Trigonometry

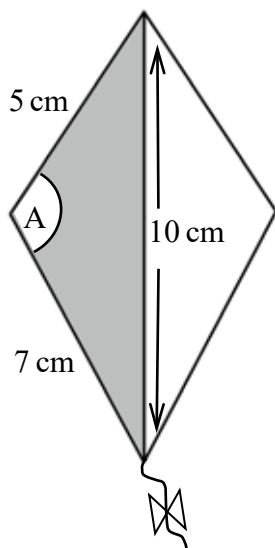
Question 27

E6.G.1

3 marks

Hansel is using the following model to build nylon kites.

Calculate the measure of $\angle A$. (3 marks)



Answer:

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc} \quad \leftarrow 1 \text{ mark for identification of cosine law}$$

$$\cos A = \frac{5^2 + 7^2 - 10^2}{2(5)(7)}$$

$$\cos A = \frac{-26}{70}$$

$$\angle A = \cos^{-1}(-0.3714\dots)$$

$$\angle A = 111.80^\circ$$

$\leftarrow 1 \text{ mark for process/substitution}$

$\leftarrow 1 \text{ mark}$

Exemplar 1

(3 marks)

$$11.80 \text{ cm}$$

E5

Mark: 1 out of 3

Rationale: No identification of cosine law
No process/substitution shown
Correct final answer (1 mark)
E5 (uses incorrect units of measure)

Exemplar 2

(3 marks)

$$\begin{aligned}\cos A &= \frac{7^2 + 5^2 - 10^2}{2 \cdot 7^2 \cdot 5^2} \\ &= \frac{49 + 25 - 100}{2 \cdot 49 \cdot 25} \\ &= -26 \\ &\quad \underline{\quad\quad\quad} \\ &\quad 2450 \\ &= -0.010612245 (\cos^{-1}) \\ &= 90.6\end{aligned}$$

E5

E6

Mark: 2 out of 3

Rationale: Correct identification of cosine law (1 mark)
Incorrect substitution
Correct final answer (follow-through error) (1 mark)
E5 (does not include units in final answer)
E6 (does not express the answer to the appropriate number of decimal places)

Exemplar 3

(3 marks)

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos A = \frac{7^2 + 5^2 - 10^2}{2 \times 7 \times 5}$$

$$\cos A = \frac{49 + 25 - 100}{70}$$

$$\cos A = \frac{-26}{70}$$

$$\cos A = 0.3714$$

$$= \cos 0.3714$$

$$\angle A = 68$$

Mark: 2 out of 3**Rationale:** Correct identification of cosine law (1 mark)

Correct substitution (1 mark)

Incorrect final answer



Question 28

E6.G.2

1 mark

Explain why a kite is not a regular polygon.

Sample Answers:

- All sides of a regular polygon are equal whereas a kite has 2 pairs of equal sides.
- All interior angles of a regular polygon are equal whereas a kite has 1 pair of equal interior angles.

Exemplar 1

(1 mark)

each side has another side that is the same as it

Mark: 0 out of 1**Rationale:** Incorrect response**Exemplar 2**

(1 mark)

because it has two pairs of equal sides
that are not opposite

Mark: 1 out of 1**Rationale:** Correct response**Exemplar 3**

(1 mark)

a regular polygon is where
all the sides & angles are
the same, a kite

looks like this



not the angles or
sides are the
same.

Mark: 1 out of 1**Rationale:** Correct response (diagram is correctly labelled) (1 mark)**Exemplar 4**

(1 mark)

Because not all of its sides are the same.

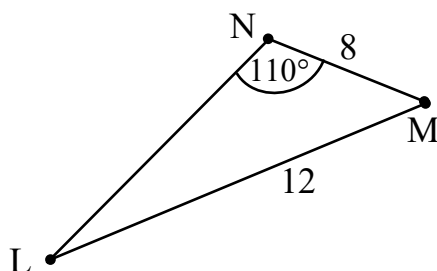
Mark: 1 out of 1**Rationale:** Correct response

Question 29

E6.G.1

3 marks

Given the following diagram:



Calculate the measure of $\angle L$. (3 marks)

Answer:

$$\frac{\sin N}{n} = \frac{\sin L}{l}$$

← 1 mark for identification of sine law

$$\frac{\sin 110^\circ}{12} = \frac{\sin L}{8}$$

$$\frac{(\sin 110^\circ)(8)}{12} = \sin L$$

$$\angle L = \sin^{-1}(0.626 \dots)$$

$$\angle L = 38.79^\circ$$

← 1 mark

Exemplar 1

(3 marks)

$$\frac{\sin 110^\circ}{12} = \frac{\sin L}{8}$$

$$L = \frac{8 \times 110}{12}$$

$$L = 73.3$$

E5

E6

Mark: 2 out of 3**Rationale:** Correct identification of sine law (1 mark)

Incorrect process (sine function not used)

Correct final answer (follow-through error) (1 mark)

E5 (does not include units in final answer)

E6 (does not express the answer to the appropriate number of decimal places)

Exemplar 2

(3 marks)

$$\frac{\sin 110^\circ}{12} = \frac{\sin L}{8}$$

$$\angle L = \sin^{-1} \left(8 \cdot \frac{\sin 110^\circ}{12} \right)$$

$$\angle L = 38^\circ$$

E6

Mark: 3 out of 3**Rationale:** Correct identification of sine law (1 mark)

Correct process/substitution (1 mark)

Correct final answer (1 mark)

E6 (rounds incorrectly)

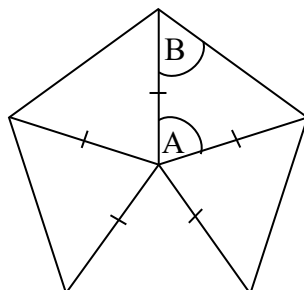
E6 (does not express the answer to the appropriate number of decimal places)

Question 30

E6.G.2

2 marks

Sherry is building a recycling station with 5 bins. The top view of the recycling station shows how each bin is an isosceles triangle and that together they form a regular pentagon.



A) Calculate the measure of $\angle A$. (1 mark)

Answer:

$$\begin{aligned}\angle A &= \frac{360^\circ}{5} \\ &= 72^\circ \quad \leftarrow 1 \text{ mark}\end{aligned}$$

B) Calculate the measure of $\angle B$. (1 mark)

Answer:

$$\begin{aligned}\angle B &= \frac{180^\circ - 72^\circ}{2} \\ &= 54^\circ \quad \leftarrow 1 \text{ mark}\end{aligned}$$

OR**Answer:**

$$\begin{aligned}\text{Measure of one interior angle} &= \frac{180^\circ(5-2)}{5} \\ &= 108^\circ \\ \angle B &= \frac{108^\circ}{2} \\ &= 54^\circ \quad \leftarrow 1 \text{ mark}\end{aligned}$$

Exemplar 1

(2 marks)

A) 60° (Equilateral)B) 60° (Equilateral)**Mark: 1 out of 2****Rationale:** Incorrect answer in Part A

Correct answer in Part B (follow-through error) (1 mark)

Exemplar 2

(2 marks)

A) $\angle A = 72^\circ$

B)

$$\frac{360}{5} = 72^\circ$$

$$180 \left(\frac{5-2}{5} \right) = 108$$

$$\angle B = 108^\circ$$

Mark: 1 out of 2**Rationale:** Correct answer in Part A (1 mark)

Incorrect answer in Part B

Question 31

E6.G.2

1 mark

Explain why a triangle cannot have two obtuse angles.

Sample Answer:

The sum of the angles in a triangle equals 180° . Since an obtuse angle is between 90° and 180° , two obtuse angles would add up to more than 180° .

Exemplar 1

(1 mark)

it can't have more than one obtuse angle because the interior angles have to add up to 180°

Mark: 0 out of 1**Rationale:** Insufficient response**Exemplar 2**

(1 mark)

No because obtuse means an Angle over 90° and a triangle can't have more than 1 angle over 90°

Mark: 0 out of 1**Rationale:** Insufficient response**Exemplar 3**

(1 mark)

A triangle cannot have more than one obtuse angle because all the angles in a triangle must total 180° , and if an obtuse angle is greater than 90° , having two obtuse angles would make the total greater than 180°

Mark: 1 out of 1**Rationale:** Correct response (1 mark)

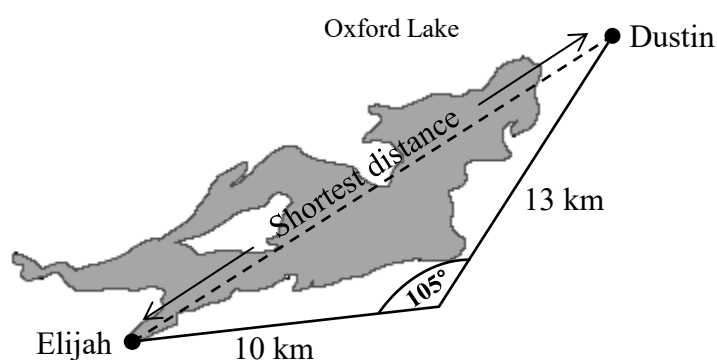
Question 32

E6.G.1

3 marks

Elijah and Dustin live across Oxford Lake from each other.

Calculate the shortest distance that Dustin must travel by snowmobile to visit his friend in winter. (3 marks)

**Answer:**

$$a^2 = b^2 + c^2 - (2bc \cos A) \quad \leftarrow 1 \text{ mark for identification of cosine law}$$

$$a^2 = 10^2 + 13^2 - [2(10)(13) \cos 105^\circ] \quad \leftarrow 1 \text{ mark for process/substitution}$$

$$a^2 = 269 - 260 \cos 105^\circ$$

$$a = \sqrt{336.292\ 951\ 7}$$

$$a = 18.34 \text{ km}$$

 $\leftarrow 1 \text{ mark}$

Exemplar 1

(3 marks)

 18.34 km **Mark: 1 out of 3**

Rationale: No identification of cosine law
No process/substitution shown
Correct final answer (1 mark)

Exemplar 2

(3 marks)

$$a^2 = b^2 + c^2 - (2bc \cos A)$$

$$a^2 = 13^2 + 10^2 - (2(13)(10) \times \cos 105^\circ)$$

$$a^2 = 169 + 100 - (260 \times \cos 105^\circ)$$

$$a^2 = 269 - (260 \times \cos 105^\circ)$$

$$a^2 = 269 - (-67.29)$$

$$a^2 = 201.7$$

$$a = 14.2 \text{ km}$$

Mark: 2 out of 3

Rationale: Correct identification of cosine law (1 mark)
Correct substitution (1 mark)
Incorrect final answer

Exemplar 3

(3 marks)

$$\text{Cosine law} = 13^2 + 10^2 - (2 \times 13 \times 10 \times \cos 105^\circ)$$

$$= 169 + 100 - (-67.29)$$

$$= 269 + 67.29$$

$$= 336.29 \text{ km}$$

Shortest distance : 336.29 km

Mark: 2 out of 3

Rationale: Correct identification of cosine law (1 mark)
Correct substitution (1 mark)
Incorrect final answer

Question 33

E6.G.2

1 mark

Identify the statement that best describes a property of a rectangle.

- A) The diagonals of a rectangle are congruent.
- B) A rectangle has only one pair of parallel sides.
- C) The diagonals of a rectangle bisect the interior angles.
- D) The diagonals of a rectangle meet at right angles.

Answer: A)



Statistics

Question 34

E5.S.1

2 marks

Hayden is a competitive diver. On his first dive, Hayden receives the following scores from the judges:

6.5 6.5 6.5 6.0 7.0 6.5 9.5

- A) Calculate the trimmed mean by removing the highest and lowest scores. (1 mark)

Answer:

$$\begin{aligned}\text{Trimmed mean: } & \frac{33}{5} \\ & = 6.6 \quad \leftarrow 1 \text{ mark}\end{aligned}$$

- B) Explain the effect of removing the highest and lowest diving scores on Hayden's mean score. (1 mark)

Sample Answers:

- Removing the outliers lowers Hayden's mean.
- Arithmetic mean: $\frac{48.5}{7} = 6.93$ therefore, the trimmed mean is lower.

Exemplar 1

(2 marks)

A) 9.5 ← outlier.

Trimmed mean: 6.5

B) B/c maybe on one of the dives there was a mistake made so it was way off.

Mark: 0 out of 2**Rationale:** Incorrect answer in Part A

Incorrect response in Part B

Exemplar 2

(2 marks)

A) 6.5 6.5 6.5 6.5 7.0 9.5
6.5 6.5 6.5 6.5 7.0

B) It makes the average more accurate when you take the highest and lowest off

Mark: 1 out of 2**Rationale:** Incorrect answer in Part A

Correct response in Part B (1 mark)

Exemplar 3

(2 marks)

A)
$$\frac{6.5 + 6.5 + 6.5 + 6.5 + 6.5 + 7.0 + 7.0}{5} = 6.6$$

B) Because in a trimmed mean largest and one smallest outliers removed.

Mark: 1 out of 2**Rationale:** Correct answer in Part A (1 mark)

Incorrect response in Part B

Question 35

E5.S.1

2 marks

In gymnastic competitions, a maximum of 10 points can be awarded per category.

The table below shows Alice's results.

Category	Weight	Points
Execution	80%	9.8
Difficulty	20%	8.3
Overall Score		

Calculate Alice's overall score using a weighted mean. (2 marks)

Answer:

$$\left. \begin{array}{l} \text{Execution: } 0.80 \times 9.8 \\ \quad = 7.84 \\ \text{Difficulty: } 0.20 \times 8.3 \\ \quad = 1.66 \end{array} \right\} \leftarrow 1 \text{ mark for process}$$

$$\begin{array}{l} \text{Overall score: } 7.84 + 1.66 \\ \quad = 9.5 \quad \leftarrow 1 \text{ mark} \end{array}$$

Exemplar 1

(2 marks)

$$.8 \times 9.8 = 7.84$$

$$.2 \times 8.3 = 1.66$$

Mark: 1 out of 2**Rationale:** Correct process (1 mark)
No final answer**Exemplar 2**

(2 marks)

$$.8 (9.8) = 7.84$$

Mark: 1 out of 2**Rationale:** Correct process (1 mark)
No final answer**Exemplar 3**

(2 marks)

$$0.8 \times 9.8 = 7.8$$

$$.2 \times 8.3 = \frac{1.6}{9.4}$$

E6

Mark: 2 out of 2**Rationale:** Correct process (1 mark)
Correct final answer (1 mark)
E6 (rounds too soon)
E6 (rounds incorrectly)

Question 36

E5.S.2

2 marks

The table below lists the daily earnings of a waiter.

\$50	\$55	\$55	\$56	\$59
\$60	\$60	\$66	\$75	\$85
\$90	\$95	\$140	\$140	\$145

Calculate the percentile rank for a daily earning of \$85. (2 marks)

Answer:

$$\left. \begin{aligned} PR &= \frac{b}{n} \times 100 \\ &= \frac{9}{15} \times 100 \\ &= 60 \end{aligned} \right\} \leftarrow 1 \text{ mark for substitution}$$

$\therefore 60 \quad \text{or} \quad 60\text{th} \quad \text{or} \quad PR_{60} \quad \leftarrow 1 \text{ mark}$

Note to marker: Award one mark for a follow-through error only if “ b ” or “ n ” is substituted correctly.

Exemplar 1

(2 marks)

$$PR = \frac{b}{n} \times 100$$

$$PR = \frac{8}{15} \times 100$$

$$PR = 53.\overline{33} \leftarrow \boxed{E4}$$

Mark: 1 out of 2**Rationale:** Incorrect substitution

Correct final answer (follow-through error) (1 mark)

E4 (does not use whole units in contextual questions involving discrete data)

Exemplar 2

(2 marks)

$$\frac{9}{15} \times 100 = 60\%$$

Mark: 1 out of 2**Rationale:** Correct substitution (1 mark)

Incorrect final answer

Exemplar 3

(2 marks)

$$\frac{(9+0.5)}{15} \times 100$$

$$\text{Percentile Rank} = \underline{63 \text{ or } 64}$$

Mark: 2 out of 2**Rationale:** Correct substitution into an alternate formula (1 mark)

Correct final answer (1 mark)

Question 37

E5.S.1

3 marks

The table below shows the total amount spent on groceries during a 12-week period.

\$72	\$126	\$84	\$113
\$113	\$142	\$126	\$126
\$97	\$111	\$108	\$95

Calculate the mean, median, and mode for these amounts. (3 marks)

Mean: _____

Median: _____

Mode: _____

Answer:

Mean: \$109.42 ← 1 mark

Median: \$112 ← 1 mark

Mode: \$126 ← 1 mark

Exemplar 1

(3 marks)

Mean: 111

72, 84, 95, 97, 108, 111, 113, 113, 126, 126, 142

Median: 111Mode: 113, 126**Mark: 0 out of 3****Rationale:** Incorrect answers**Exemplar 2**

(3 marks)

Mean: \$ 109.4 E6

72, 84, 95, 97, 108, 111, 113, 113, 126, 126, 142

Median: \$ 111E5Mode: 126**Mark: 2 out of 3****Rationale:** Correct mean (1 mark)

Incorrect median

Correct mode (1 mark)

E5 (does not include units in final answer)

E6 (does not express the answer to the appropriate number of decimal places)

Exemplar 3

(3 marks)

Mean: 109.4 E6E5Median: 111, 11372 84 95 97 108 111 113 113 126 126 126
142Mode: 126**Mark: 3 out of 3****Rationale:** Correct mean (1 mark)

Correct median (1 mark)

Correct mode (1 mark)

E5 (does not include units in final answer)

E6 (does not express the answer to the appropriate number of decimal places)



Appendices

Appendix A:

Table of Questions by Unit and Learning Outcome

Vehicle Finance		
Question	Learning Outcome	Mark
1	E5.V.1	2
2 a)	E5.V.1	2
2 b)	E5.V.1	1
3	E5.V.1	1
4	E5.V.1	3
5	E5.V.1	1
6	E5.V.1	2
7	E5.V.1	3
8	E5.V.1	2
		Total = 17
Precision Measurement		
Question	Learning Outcome	Mark
9	E5.P.1	2
10	E5.P.1	1
11	E5.P.1	1
12	E5.P.1	1
13	E5.P.1	1
14	E5.P.1	2
		Total = 8
Probability		
Question	Learning Outcome	Mark
15 a)	E6.P.1	3
15 b)	E6.P.1	1
16 a)	E6.P.1	1
16 b)	E6.P.1	1
17	E6.P.1	1
18 a)	E6.P.1	1
18 b)	E6.P.1	1
19	E6.P.1	1
		Total = 10

Home Finance		
Question	Learning Outcome	Mark
20 a)	E6.H.1	3
20 b)	E6.H.1	1
21 a)	E6.H.1	1
21 b)	E6.H.1	1
22	E6.H.1	1
23	E6.H.1	1
24 a)	E6.H.1	2
24 b)	E6.H.1	1
25	E6.H.1	2
26	E6.H.1	1
Total = 14		
Geometry and Trigonometry		
Question	Learning Outcome	Mark
27	E6.G.1	3
28	E6.G.2	1
29	E6.G.1	3
30 a)	E6.G.2	1
30 b)	E6.G.2	1
31	E6.G.2	1
32	E6.G.1	3
33	E6.G.2	1
Total = 14		
Statistics		
Question	Learning Outcome	Mark
34 a)	E5.S.1	1
34 b)	E5.S.1	1
35	E5.S.1	2
36	E5.S.2	2
37	E5.S.1	3
Total = 9		

Appendix B:

Irregularities in Provincial Tests

A Guide for Local Marking

During the marking of provincial tests, irregularities are occasionally encountered in test booklets. The following list provides examples of irregularities for which an *Irregular Test Booklet Report* should be completed and sent to the department:

- completely different penmanship in the same test booklet
- incoherent work with correct answers
- notes from a teacher indicating how he or she has assisted a student during test administration
- student offering that he or she received assistance on a question from a teacher
- student submitting work on unauthorized paper
- evidence of cheating or plagiarism
- disturbing or offensive content
- no responses provided by the student or only incorrect responses (“0”)

Student comments or responses indicating that the student may be at personal risk of being harmed or of harming others are personal safety issues. This type of student response requires an immediate and appropriate follow-up at the school level. In this case, please ensure the department is made aware that follow-up has taken place by completing an *Irregular Test Booklet Report*.

Except in the case of cheating or plagiarism where the result is a provincial test mark of 0%, it is the responsibility of the division or the school to determine how they will proceed with irregularities. Once an irregularity has been confirmed, the marker prepares an *Irregular Test Booklet Report* documenting the situation, the people contacted, and the follow-up. The original copy of this report is to be retained by the local jurisdiction and a copy is to be sent to the department along with the test materials.

Irregular Test Booklet Report

Test: _____

Date marked: _____

Booklet No.: _____

Problem(s) noted: _____

Question(s) affected: _____

Action taken or rationale for assigning marks: _____

Follow-up: _____

Decision: _____

Marker's Signature: _____

Principal's Signature: _____

For Department Use Only—After Marking Complete

Consultant: _____

Date: _____

Appendix C:

Communications Errors

Communication Errors

Communication errors are errors not conceptually related to the learning outcomes associated with the question. The following communication errors will result in a 0.5 mark deduction. Each error can only be deducted once per test and is tracked in a separate section on the *Scoring Sheet*.

The total mark deduction for communication errors for any student response is not to exceed the marks awarded for that response. For example, there would be no communication error deductions if no marks were awarded for a given response.

E1 (Final Answer)

- final answer not clearly indicated (e.g., 3/4 and 3:1 presented, but final answer not indicated)
- answer is presented in another part of the question
- too much information is presented in the answer and the information is numerically and conceptually correct (If contradictory information is provided, no mark is awarded.)

E2 (Notation)

- dimensions written in an alternative form than requested (e.g., write the tolerance in the form nominal value $\pm \frac{1}{2}$ tolerance and student gives maximum $\begin{matrix} + 0 \\ - \text{tolerance} \end{matrix}$)
- answer expressed in an alternative form than requested (e.g., express probability as a percentage and student gives a decimal form)

E3 (Transcription/Transposition)

- makes a transcription error (inaccurate transferring of information from one part of the page to another)
- makes a transposition error (changing order of digits)

E4 (Whole Units)

- does not use whole units in contextual questions involving discrete data (e.g., people, cans of paint, percentile rank)

E5 (Units)

- uses incorrect units of measure
- does not include units in final answer (e.g., missing dollar sign for monetary values, missing degrees for angles)
- answer stated in gradians or radians instead of degrees

E6 (Rounding)

- rounds incorrectly
- rounds too soon
- does not express the answer to the appropriate number of decimal places (e.g., monetary values are not expressed to two decimal places)

