Grade 12
Essential Mathematics
Achievement Test

Marking Guide

June 2016
Manitoba Education and Advanced Learning Cataloguing in Publication Data

Grade 12 essential mathematics achievement test.
Marking Guide. June 2016

This resource is available in print and electronic formats.

ISBN: 978-0-7711-6182-7 (print)

1. Educational tests and measurements—Manitoba.
3. Mathematics—Examinations, questions, etc.
4. Mathematics—Study and teaching (Secondary)—Manitoba.
510.76

Manitoba Education and Advanced Learning
School Programs Division
Winnipeg, Manitoba, Canada

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Websites are subject to change without notice.

Disponible en français.

Available in alternate formats upon request.
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Marking Guidelines


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.

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.

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” and/or “NR” only (e.g., student was present but did not attempt any questions) please document this on the Irregular Test Booklet Report.
Presentation of the Student Samples

Each constructed-response question is presented using the following sections:

<table>
<thead>
<tr>
<th>Test Item Number</th>
<th>Maximum Number of Marks Allotted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 4</td>
<td>(4 Marks)</td>
</tr>
</tbody>
</table>

Yuri wants to purchase homeowner’s insurance for his house valued at $230 000 which is located in Area 4. He wants a standard policy with a $500 deductible. Calculate the total cost of the homeowner’s insurance.

**Answer:**

First $200 000: $966 ← 1 mark

Table value: 4.72 ← 1 mark

Next $30 000:

\[
\frac{30 000}{1000} \times 4.72
\]

= $141.60 ← 1 mark

Total cost of insurance: $966 + $141.60

= $1107.60 ← 1 mark

**Note to marker:** Award 1 mark if the correct table value is indicated on the table.

Exemplar 2

\[996 + 4.72 \times 30\]

\[996 + 141.6 = 1137.6 + 500 = 1637.6\]

the total cost is $1637.6

**Mark: 3 out of 4**

**Rationale:**
- Correct table value (1 mark)
- Correct amount on first $200 000 (1 mark)
- Correct amount on next $30 000 (1 mark)
Jin is purchasing his first house. State 1 additional (one-time) cost to consider when purchasing his house.

**Sample answers:**

<table>
<thead>
<tr>
<th>Additional Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>utility hook-up charges</td>
</tr>
<tr>
<td>interest adjustment</td>
</tr>
<tr>
<td>property tax adjustment</td>
</tr>
<tr>
<td>homeowner insurance adjustment</td>
</tr>
<tr>
<td>land transfer tax</td>
</tr>
<tr>
<td>moving</td>
</tr>
<tr>
<td>decor/renovation</td>
</tr>
<tr>
<td>appliances</td>
</tr>
<tr>
<td>immediate repairs</td>
</tr>
<tr>
<td>furniture</td>
</tr>
<tr>
<td>property survey</td>
</tr>
<tr>
<td>home inspection fee</td>
</tr>
<tr>
<td>lawyer/legal fees</td>
</tr>
<tr>
<td>appraisal fee</td>
</tr>
<tr>
<td>mortgage insurance</td>
</tr>
</tbody>
</table>
Exemplar 1

Heating

Mark: 0 out of 1
Rationale: Incorrect response (ongoing cost)

Exemplar 2

Jin will need to remember that in order to live in his house comfortably, he will need a bed. So, one additional (one-time) cost to consider when purchasing his house would be a bed frame.

Mark: 1 out of 1
Rationale: Correct response

Exemplar 3

A one time cost that could be applicable to buying a house, assuming it had a previous owner, could be a house inspector.

Mark: 1 out of 1
Rationale: Correct response
Identify the 2 advantages of renting a house compared to buying a house from the list below:

- building equity
- lower initial (up front) costs
- ability to renovate
- move/leave whenever you want without penalty
- insurance is cheaper
- not responsible for any damages

Note: Place one response per line.

Advantage 1: ____________________________________________

Advantage 2: ____________________________________________

**Answer:**

Advantage 1: _lower initial (up front) costs_ ____________________________________________

Advantage 2: _insurance is cheaper_ ____________________________________________

(2 × 1 mark)

**Note to marker:** Award a maximum mark of 1 mark for each line.
Exemplar 1

(2 Marks)

Advantage 1: cheaper to pay for

Advantage 2: can move out anytime

Mark: 0 out of 2
Rationale: - Two incorrect responses

Exemplar 2

(2 Marks)

Advantage 1: Insurance is cheaper

Advantage 2: move/leave whenever you want without penalty

Mark: 1 out of 2
Rationale: - One correct response (insurance) (1 mark)

Exemplar 3

(2 Marks)

Advantage 1: not responsible for any damages

Advantage 2: lower initial costs

Mark: 1 out of 2
Rationale: - One correct response (lower initial costs) (1 mark)
David took out a mortgage of $259,000 for a new house. He has arranged financing for 4% over 20 years.

A) Calculate the monthly mortgage payment. (2 marks)

Answer:

Table value: 6.04 ← 1 mark

Monthly mortgage payment: \( \frac{259,000}{1000} \times 6.04 \)

\( = 1564.36 \) ← 1 mark

Note to marker: Award 1 mark if the correct table value is indicated on the table.

B) Calculate the interest on the first month’s payment. (2 marks)

Answer:

Interest: \( I = Prt \)

\( = 259,000 \times 0.04 \times \frac{1}{12} \) ← 1 mark for all correct substitutions

\( = 863.33 \) ← 1 mark


**Exemplar 1**

(4 Marks)

A) \[ \frac{259,000}{6.04} = 42,800.7 \]

B)

Mark: 1 out of 4
Rationale: - Correct table value in Part A (1 mark)
- Incorrect answer in Part B

---

**Exemplar 2**

(4 Marks)

A) \[ \frac{259,000 \times 6.26}{1000} = 1,362.34 \]

B) \[ 259,000 \times 0.04 \times 20 = 5267.00 \]

Mark: 1 out of 4
Rationale: - Incorrect table value in Part A
- Correct monthly mortgage payment in Part A (follow-through error) (1 mark)
- Incorrect answer in Part B

---

**Exemplar 3**

(4 Marks)

A) \[ \frac{259,000 \times 6.04}{1000} = \text{$1564.36 per month} \]

B) \[ 1564.36 \times 0.04 = \text{$62.57 interest} \]

Mark: 2 out of 4
Rationale: - Correct table value in Part A (1 mark)
- Correct monthly mortgage payment in Part A (1 mark)
- Incorrect answer in Part B
Yuri wants to purchase homeowner’s insurance for his house valued at $230 000 which is located in Area 4. He wants a standard policy with a $500 deductible. Calculate the total cost of the homeowner’s insurance.

**Answer:**

*First $200 000:*  
\[ \text{Table value: } 4.72 \rightarrow 1 \text{ mark} \]

Next $30 000:

\[ \frac{30 000}{1000} \times 4.72 \]

\[ = \$141.60 \rightarrow 1 \text{ mark} \]

**Total cost of insurance:** $966 + $141.60

\[ = \$1107.60 \rightarrow 1 \text{ mark} \]

**Note to marker:** Award 1 mark if the correct table value is indicated on the table.
Exemplar 1

Total cost for home owners insurance is $1107.60 with a $500 deductible.

Mark: 1 out of 4
Rationale: - Correct total insurance cost (1 mark)

Exemplar 2

996 + 4.72 \times 30
996 + 141.6 = 1137.6 + 500 = $1637.6

The total cost is $1637.6

Mark: 2 out of 4
Rationale: - Incorrect amount on first $200,000
- Correct table value (1 mark)
- Correct amount on next $30,000 (1 mark)

Exemplar 3

$200,000.00 at $966.00
$30,000.00 at $141,600.00
$4.72 \times $30,000.00
= $141,600.00

$966.00 + $141,600.00 = $142,566.00

Yuri's homeowners' insurance will cost him $142,566.00 for his $230,000.00 house

Mark: 3 out of 4
Rationale: - Correct amount on first $200,000 (1 mark)
- Correct table value (1 mark)
- Correct total insurance cost (follow-through error) (1 mark)
Marcía earns $52,500 annually and wants to buy a new house. Her monthly mortgage payments will be $725, the monthly property taxes will be $262.50, and the monthly heating costs will be $215.

A) Calculate Marcía’s Gross Debt Service Ratio (GDSR). (3 marks)

**Answer:**

Gross monthly income: $52,500 / 12 = $4,375

{\[
\text{GDSR} = \frac{\text{monthly mortgage + property + heating}}{\text{Gross monthly income}} \times 100
\]}

{\[
= \left( \frac{\$725 + \$262.50 + \$215}{\$4375} \right) \times 100
\]}

No mark for 1 correct substitution

OR

1 mark for 2 or 3 correct substitutions

OR

2 marks for all correct substitutions

= 27.5% ← 1 mark

**Note to marker:** Allow for various roundings. Units are not required.

B) Explain whether Marcía will be approved for the home mortgage. (1 mark)

**Answer:**

Yes, Marcia will be approved because her GDSR is below 32%.

**Note to marker:** Students must refer to 32%.
Exemplar 1  
(4 Marks)

A) \[ \frac{725 + 262.50 + 215}{52,500} \times 100 = 987.90 \]

B) No because it's over 42%  

Mark: 1 out of 4  
Rationale: - Three correct substitutions in Part A (1 mark)  
- Incorrect response in Part B

Exemplar 2  
(4 Marks)

A) \[ \frac{725 + 262 + 215}{52,500} \times 100 = 2.289 \]

B) Yes because the GDSR is low  

Mark: 2 out of 4  
Rationale: - Two correct substitutions in Part A (1 mark)  
- Correct GDSR in Part A (follow-through error) (1 mark)  
- Incorrect response in Part B

Exemplar 3  
(4 Marks)

A) \[ \frac{52,500}{12} = 4375 \]  
B) \[ \frac{725 + 262.50 + 215}{4375} \times 100 = 27.5\% \]

B) No, GDSR has to be 23% or lower  

Mark: 3 out of 4  
Rationale: - All correct substitutions in Part A (2 marks)  
- Correct GDSR in Part A (1 mark)  
- Incorrect response in Part B
State 1 energy-efficient improvement available to homeowners.

*Sample answers:*

- high efficiency furnace
- energy efficient windows
- energy efficient washer and dryer
- high efficiency hot water tank
Exemplar 1

Windows

Mark: 0 out of 1
Rationale:  - Insufficient response

Exemplar 2

Instead of electric heat you can burn wood to heat your home

Mark: 0 out of 1
Rationale:  - Incorrect response

Exemplar 3

Energy efficient appliances

Mark: 1 out of 1
Rationale:  - Correct response

Exemplar 4

Replace an old wood stove with a new high efficiency stove

Mark: 1 out of 1
Rationale:  - Correct response
### Question 7

(2 Marks)

Josephine has placed 3 white, 5 blue, and 6 purple marbles in a bag.

**A)** State the probability of randomly selecting a purple marble from the bag. (1 mark)

**Answer:**

\[
\frac{6}{14} \text{ or } \frac{3}{7} \text{ or } 0.43 \text{ or } 43\% \text{ or } 3:7 \text{ or } 3\text{ out of }7
\]

**B)** A purple marble is pulled out of the bag and not replaced. State the probability of randomly selecting another purple marble from the bag. (1 mark)

**Answer:**

\[
\frac{5}{13} \text{ or } 0.38 \text{ or } 38\% \text{ or } 5:13 \text{ or } 5\text{ out of }13
\]

*Note to marker:* Accept equivalent representations.
Exemplar 1 (2 Marks)

A) \( P(\text{select purple}) \frac{6}{8} = 6 : 8 \)

B) \( P(\text{selecting another purple}) \frac{5}{8} = 5 : 8 \)

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

Exemplar 2 (2 Marks)

A) \( P(\text{purple marble}) = \frac{\text{can}}{\text{total}} = \frac{6}{14} \times 100 = 42.85714 \times 100 = 43\% \) chance of selecting a purple marble

B) \( P(\text{purple marble}) = \frac{5}{14} \)

Mark: 1 out of 2
Rationale: - Correct answer in Part A (1 mark)
- Incorrect answer in Part B

Exemplar 3 (2 Marks)

A) \( 6 + 5 + 3 = 14 \) marbles
\( \frac{6}{14} = 0.4285714 \times 100 = 43\% \) probability of pulling out a purple marble

B) \( 13 \) marbles
\( \frac{5}{13} \times 100 = 38\% \) probability of pulling another purple marble

Mark: 2 out of 2
Rationale: - Correct answer in Part A (1 mark)
- Correct answer in Part B (1 mark)
State the odds in favour of a tidal wave occurring given that the probability for this event is 3 out of 147.

Answer:

3 : 144 or 3 to 144
**Exemplar 1**

\[
\frac{3}{147} \times 100 = 2\%
\]

Mark: 0 out of 1
Rationale: Incorrect answer

**Exemplar 2**

\[
P(\text{tidal wave}) = \frac{3}{147} \quad 3:147
\]

Mark: 0 out of 1
Rationale: Incorrect answer

**Exemplar 3**

\[
3:144
\]

The odds are 3 to 144 of a Tidal wave happening.

Mark: 1 out of 1
Rationale: Correct answer
A game at a summer carnival costs $2 to play. The prize at this game is a stuffed animal valued at $10. The probability of winning the game is 27%.

A) Calculate the expected value (EV) for the game from the player’s perspective. (3 marks)

Answer:

\[ \text{gain} = \$10 - \$2 = \$8 \]
\[ \text{loss} = \$2 \]
\[ \text{EV} = P(\text{win}) \times \text{gain} - P(\text{lose}) \times \text{loss} \]
\[ = (0.27)(\$8) - (0.73)(\$2) \]
\[ = \$0.70 \]

\[ \text{Average winnings: } (0.27)(\$10) \]
\[ = \$2.70 \]
\[ \text{EV} = \$2.70 - \$2.00 \]
\[ = \$0.70 \]

OR

No mark for 1 correct substitution
1 mark for 2 or 3 correct substitutions
2 marks for all correct substitutions

→ 1 mark

B) Justify whether the owner of the game should continue offering it at the carnival based on your answer in Part A. (1 mark)

Sample answers:

- No, it has a positive expected value for the player so the owner will lose money over time.
- No, it has a negative expected value for the owner.

Note to marker: Accept all reasonable justifications.
Exemplar 1

A) $E = P_{\text{win}} \times \text{gain} - P(\text{lose}) \times \text{loss}$

$2 \times 10 - \frac{27}{100} \times 8 = 17.84$

B) yes the owner should because expected value is greater than $10$

Mark: 1 out of 4
Rationale:  
- Incorrect substitutions in Part A
- Correct EV in Part A (follow-through error) (1 mark)
- Incorrect response in Part B

Exemplar 2

A) $\frac{27 \times 10 - 73 \times 2}{27 - 146} = -\frac{124}{124} = -1$

B) Yes, higher positive outcome. If played multiple times, should go positive.

Mark: 2 out of 4
Rationale:  
- Three correct substitutions in Part A (1 mark)
- Correct EV in Part A (follow-through error) (1 mark)
- Incorrect response in Part B

Exemplar 3

A) $\frac{27}{100} \times 10 - \frac{73}{100} \times 2 = 2.16$

B) The owner is making a profit of 70 cents per play so he should continue

Mark: 3 out of 4
Rationale:  
- All correct substitutions in Part A (2 marks)
- Correct EV in Part A (1 mark)
- Incorrect response in Part B
State the probability of “13 out of 50” as a decimal and a percent.

Decimal: ________________

Percent: ________________

**Answers:**

Decimal: _______ 0.26 _______ ← 1 mark 

Percent: _______ 26% _______ ← 1 mark 

(2 × 1 mark)
This page was intentionally left blank.
A group of 30 students were given 4 choices and asked to choose their favourite colour. The results were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Red</th>
<th>Blue</th>
<th>Yellow</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>12</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

The teacher states “If I choose a student at random, there is a 25% probability that their favourite colour is green.”

The teacher’s claim is an example of theoretical probability. Justify the teacher’s claim.

**Sample answers:**

- *The students were given four choices and green is one choice.*
- *The theoretical probability does not depend on what other students have chosen.*
Exemplar 1

\[ \frac{3}{30} = \frac{1}{10} \]

Mark: 0 out of 1
Rationale: Incorrect response

Exemplar 2

\[ P(\text{green}) \frac{3}{27} \quad \frac{3}{27} \quad \frac{27}{3} \quad \frac{27}{3} \]

There are only 3 green marbles while there are multiple other colours to choose from so if she picks a student she probably won’t pick the student whose fav colour is green.

Mark: 0 out of 1
Rationale: Incorrect response

Exemplar 3

The student has 4 choices so there is a 25% chance that he or she will pick green.

\[ \frac{1}{4} = .25 \]

Mark: 1 out of 1
Rationale: Correct response
Choose the letter that best completes the statement below.

Sharon would like to borrow a specific book from the local library. The odds against the book being available are 1 : 99. The probability of the book being available is:

a) \( \frac{2}{98} \)

b) \( \frac{99}{1} \)

c) \( \frac{1}{100} \)

d) \( \frac{99}{100} \)

Answer: \(d)\)
This page was intentionally left blank.
Omar buys a new car with a base price of $21,800 and purchases the following options:

- Navigation system: $1000
- Sound system: $800

Calculate the cost, after taxes, of purchasing the new vehicle if he receives $3000 for his trade-in.

**Answer:**

\[
\begin{align*}
\text{Base price} & \quad 21,800 \\
\text{Navigation system} & \quad + 1,000 \\
\text{Sound system} & \quad + 800 \\
\text{Total with options} & \quad = 23,600 \\
\text{Subtract trade-in} & \quad - 3,000 \\
\text{Subtotal} & \quad = 20,600 \quad \leftarrow 1 \text{ mark} \\
\text{Add taxes} & \quad \times 1.13 \\
\text{Total Cost} & \quad = 23,278 \quad \leftarrow 1 \text{ mark}
\end{align*}
\]
Exemplar 1  

(base price - 21800  
navigation system - 1000  
sound system - 800  

$23600  
\times 1.13  
$26668  
-3000  

Mark: 1 out of 2  
Rationale:  
- Incorrect subtotal  
- Correct total (follow-through error) (1 mark)

Exemplar 2  

21,800 - 3000 +1000 +800 = 20,600 \times 1.13 = $23,278

Mark: 1 out of 2  
Rationale:  
- Correct subtotal (1 mark)  
- Incorrect total cost

Exemplar 3  

21800 - 3000 + 1000 + 800 = 20 600 \times 1.13 = $23 278

Mark: 2 out of 2  
Rationale:  
- Correct subtotal (1 mark)  
- Correct total cost (1 mark)
State 1 disadvantage of buying a used vehicle.

Sample answers:

– no warranty
– you do not know how the car was taken care of before you purchased it
– hidden damage
– can’t build a used car to order
– may not have all the newest safety features or technologies
– higher interest rate for financing
Exemplar 1

Paying the same insurance as a new vehicle, maintenance costs a lot.

Mark: 0 out of 1
Rationale: - Correct response not clearly indicated

Exemplar 2

It could have mechanical problems.

Mark: 1 out of 1
Rationale: - Correct response

Exemplar 3

You usually do not have any warranty left.

Mark: 1 out of 1
Rationale: - Correct response
Michel is purchasing a new vehicle. The price of the vehicle is $30,000 and it will depreciate 20% in the first year.

Calculate the value of the vehicle after the first year.

**Answer:**

Depreciation amount: $30,000 \times 0.20$

\[ = $6000 \quad \text{← 1 mark} \]

Value: $30,000 - $6000$

\[ = $24,000 \quad \text{← 1 mark} \]

**OR**

Value: $30,000 \times 0.80$

\[ = $24,000 \quad \text{← 1 mark} \]
**Exemplar 1**  
(2 Marks)

\[ 30,000 - 0.20\% = 29,999.80 \]

Mark: 0 out of 2  
Rationale:  
- Incorrect depreciation amount  
- Incorrect value

**Exemplar 2**  
(2 Marks)

$24,000

Mark: 1 out of 2  
Rationale:  
- Correct value (1 mark)

**Exemplar 3**  
(2 Marks)

$30,000 - 20\% = $24,000 after the first year

Mark: 2 out of 2  
Rationale:  
- Correct depreciation amount (1 mark)  
- Correct value (1 mark)
Manhattan is considering leasing a vehicle for her courier company. State 2 reasons why she should not lease a vehicle.

Note: Place one response per line.

Reason 1: ________________
Reason 2: ________________

Sample answers:

- excess kilometres will cost more
- excess damage to the leased vehicle will result in more charges at the end of the lease (Damages may not need to be repaired on an owned vehicle if they are cosmetic in nature.)
- always have a monthly payment
- by leasing, the vehicle cannot be used as an asset to secure additional funds (borrowing from a bank)
- leasing is more expensive than buying in the long run

(2 × 1 mark)
Exemplar 1

- Because it's not 100% yours
- You have to keep it the way it is, no changing anything about the car

Mark: 1 out of 2
Rationale: - Incorrect response (ownership)
- Correct response (no modifications) (1 mark)

Exemplar 2

- You don't keep the vehicle in the end
- There is a limit on how many kms you can drive it

Mark: 1 out of 2
Rationale: - Incorrect response (ownership)
- Correct response (kms) (1 mark)

Exemplar 3

- You get charged for extra km's you drive
- You don't get your deposit back if there are any damages, for example from gravel

Mark: 2 out of 2
Rationale: - Two correct responses
The fuel economy of Gina’s vehicle is 7 L/100 km. She is planning to drive her vehicle from Winnipeg to Toronto, a distance of 2230 kilometres.

A) Determine the total amount of fuel in litres required for the trip. (2 marks)

Answer:

\[
FE = \frac{\text{Fuel used in litres}}{\text{Distance in km}}
\]

\[7\text{L/100 km} = \frac{\text{Fuel used in litres}}{2230 \text{ km}} \rightarrow 1 \text{ mark}\]

Fuel used in litres = 2230 km \times \frac{7 \text{ L}}{100 \text{ km}}

Fuel used in litres = 156.1 L \rightarrow 1 \text{ mark}

OR

\[
\frac{7 \text{ L}}{100 \text{ km}} = \frac{x}{2230 \text{ km}} \rightarrow 1 \text{ mark for process}
\]

\[x = 156.1 \text{ L} \rightarrow 1 \text{ mark}\]

Note to marker: Units are not required.

B) Determine the cost of the trip if the fuel price is $1.30/L. (1 mark)

Answer:

Cost = 156.1 L \times $1.30/L

= $202.93 \rightarrow 1 \text{ mark}
**Exemplar 1**

A) \( \frac{7 \text{L} \times 100}{2230} = 0.31390 \text{L} / 100 \text{km} \)

B) \( \frac{1.30 \times 2230}{100} \)

\[ = 28.99 \]

Mark: 0 out of 3

Rationale: - Incorrect process in Part A
- Incorrect litres in Part A (units)
- Incorrect answer in Part B

**Exemplar 2**

A) \( 7 \times 12.3 = 86 / \text{L} \)

B) \( 86.1 \times 1.30 = $111.93 \)

Mark: 1 out of 3

Rationale: - Incorrect process in Part A
- Incorrect litres in Part A
- Correct answer in Part B (follow-through error) (1 mark)

**Exemplar 3**

A) \( \frac{7 \text{L} \times 2230}{100} = 1562 \)

B) \( 1562 \times 1.30 = $202.80 \)

Mark: 3 out of 3

Rationale: - Correct process in Part A (1 mark)
- Correct litres in Part A (rounded) (1 mark)
- Correct answer in Part B (1 mark)
Alicia is purchasing a new vehicle for $24,000, after taxes. She is financing the vehicle for 4% over 5 years.

<table>
<thead>
<tr>
<th>Interest Rate (%)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.00</td>
<td>85.15</td>
<td>43.42</td>
<td>29.52</td>
<td>22.58</td>
<td>18.42</td>
</tr>
<tr>
<td>4.25</td>
<td>85.26</td>
<td>43.54</td>
<td>29.64</td>
<td>22.69</td>
<td>18.53</td>
</tr>
<tr>
<td>4.50</td>
<td>85.38</td>
<td>43.65</td>
<td>29.75</td>
<td>22.80</td>
<td>18.64</td>
</tr>
<tr>
<td>4.75</td>
<td>85.49</td>
<td>43.76</td>
<td>29.86</td>
<td>22.92</td>
<td>18.76</td>
</tr>
<tr>
<td>5.00</td>
<td>85.61</td>
<td>43.87</td>
<td>29.97</td>
<td>23.03</td>
<td>18.87</td>
</tr>
<tr>
<td>5.25</td>
<td>85.72</td>
<td>43.98</td>
<td>30.08</td>
<td>23.14</td>
<td>18.99</td>
</tr>
<tr>
<td>5.50</td>
<td>85.84</td>
<td>44.10</td>
<td>30.20</td>
<td>23.26</td>
<td>19.10</td>
</tr>
<tr>
<td>5.75</td>
<td>85.95</td>
<td>44.21</td>
<td>30.31</td>
<td>23.37</td>
<td>19.22</td>
</tr>
<tr>
<td>6.00</td>
<td>86.07</td>
<td>44.32</td>
<td>30.42</td>
<td>23.49</td>
<td>19.33</td>
</tr>
</tbody>
</table>

A) Calculate Alicia’s monthly vehicle payment. (2 marks)

**Answer:**

**Table value:** $18.42 ← 1 mark

**Monthly payment:** \( \frac{\$24,000}{1000} \times 18.42 \)

\[ = \$442.08 \] ← 1 mark

**Note to marker:** Award 1 mark if the correct table value is indicated on the table.

B) Calculate the total amount of interest she will pay over the 5 years. (2 marks)

**Answer:**

**Total amount paid:** \( \$442.08 \times 12 \times 5 \)

\[ = \$26,524.80 \] ← 1 mark

**Total interest:** \( \$26,524.80 - \$24,000 \)

\[ = \$2,524.80 \] ← 1 mark


**Exemplar 1**  

(4 Marks)  

A) \[
\frac{24000}{1000} \times 22.58 = \$541.92
\]

B) \[
\text{I} = \text{P} \times \text{r} \times \text{t} \\
\text{I} = 24000 \times 0.04 \times 5 = \$4800
\]

Mark: 1 out of 4  
Rationale:  
- Incorrect table value in Part A  
- Correct monthly payment in Part A (follow-through error) (1 mark)  
- Incorrect answer in Part B

**Exemplar 2**  

(4 Marks)  

A) \[
\frac{24000}{1000} \times 18.42 = \$442.08
\]

B) \[
24000 \times 4 \times 5 = \$4800
\]

Mark: 2 out of 4  
Rationale:  
- Correct table value in Part A (1 mark)  
- Correct monthly payment in Part A (1 mark)  
- Incorrect answer in Part B

**Exemplar 3**  

(4 Marks)  

A) \[
\frac{24000 \times 18.42}{1000} = \$442.08
\]

B) \[
\$442.08 \times 5 = \$2210.40
\]

Mark: 2 out of 4  
Rationale:  
- Correct table value in Part A (1 mark)  
- Correct monthly payment in Part A (1 mark)  
- Incorrect answer in Part B
Julie is moving from rural Manitoba to Winnipeg for her job. Her insurance broker told her that it will now be more expensive to insure her car.

A) State why Julie’s premiums will increase. (1 mark)

*Sample answers:*

– Higher traffic volume in Winnipeg. This means there is a higher risk of making a claim.
– She increased her third-party liability.
– Winnipeg is in Territory 1, and MPI charges more to insure the vehicle in this area.

B) Julie retires from her job and wants to continue driving her car. State what she can do to decrease her premiums. (1 mark)

*Sample answers:*

– Julie should change her insurance from all-purpose to pleasure.
– Julie could increase her deductible.
– Julie could decrease her third party liability.
**Exemplar 1**

A) There is a greater likelihood of her getting in an accident because there are more vehicles in the city.

B) She could get a different plan!

Mark: 1 out of 2  
Rationale: - Correct response in Part A (1 mark)  
- Insufficient response in Part B

**Exemplar 2**

A) She needs to drive to work every single day on city streets, which are busier so having an accident is more likely.  

++Risk  
++cost

B) Move back to the country, drive less.

Mark: 1 out of 2  
Rationale: - Correct response in Part A (1 mark)  
- Incorrect response in Part B (answer not clearly indicated)

**Exemplar 3**

A) **Risk**

B) **Change it from a work vehicle to pleasure**

Mark: 1 out of 2  
Rationale: - Insufficient response in Part A  
- Correct response in Part B (1 mark)
Pedro is building a triangular roof for a house. He would like to build it as steep as possible so snow does not accumulate on the roof.

A) State whether Pedro’s roof should be an equilateral or isosceles triangle. (1 mark)

*Answer:*

*Isosceles*

B) Justify your answer from Part A. (1 mark)

*Sample answers:*

- *Isosceles can provide the steepest pitch provided that the apex angle is less than 60°.*
- *Base angles are greater than 60°.*

*Note to marker: Accept a properly labelled sketch as a justification.*
Exemplar 1

(2 Marks)

A) He should have an isosceles triangle so that the snow can evenly fall off both sides of the roof.

B)

\[ \text{40°} \quad \text{40°} \]

Mark: 1 out of 2
Rationale: - Correct triangle in Part A (1 mark)
          - Incorrect justification in Part B (base angle)

Exemplar 2

(2 Marks)

A) ISOSCELES
B) because the roof would be at its steepest IF you make 2 sides equal rather than 3.

Mark: 1 out of 2
Rationale: - Correct triangle in Part A (1 mark)
          - Incorrect justification in Part B

Exemplar 3

(2 Marks)

A) It should be an isosceles
B) because then he could have longer sides and thus steeper angles.

Ex)

\[ \text{Equilateral} \quad \text{Isosceles} \]

Mark: 2 out of 2
Rationale: - Correct triangle in Part A (1 mark)
          - Correct justification in Part B (1 mark)
A gardener has been hired to stabilize a spruce tree that was damaged in a wind storm. The gardener decides to attach a rope from 25 metres up the spruce tree to the base of another tree 10 metres away. Calculate the length of the rope between the 2 trees, as shown in the diagram (excluding the knots).

Answer:

\[ a^2 = b^2 + c^2 - 2bc \cos A \]

\[ a^2 = (10)^2 + (25)^2 - 2(10)(25) \cos 100^\circ \]

\[ a^2 = 100 + 625 - 500 \cos 100^\circ \]

\[ a^2 = 725 - 500(-0.1736) \]

\[ a^2 = 811.8 \]

\[ a = \sqrt{811.8} \]

\[ a = 28.5 \text{ m} \]

Note to marker: Allow for various roundings. Units are not required.
Exemplar 1

Exemplar 2

Exemplar 3
Given the following situation:

A) Identify the formula that would be most appropriate to solve for angle A. (1 mark)

   a) \( \cos A = \frac{\text{adj}}{\text{hyp}} \)

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

   c) \( \sin A = \frac{\sin B}{b} \)

   d) \( \sin A = \frac{\text{opp}}{\text{hyp}} \)

   Answer: \( b \)

B) Justify your choice from Part A. (1 mark)

   Answer:

   You are given three sides to solve an angle; therefore, you use cosine law.
**Exemplar 1**

(2 Marks)

A) Answer: ________  

B) I would choose this method because it would find the angle more accurately.

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

---

**Exemplar 2**

(2 Marks)

A) Answer: ________  

B) you are given all the info, just have to plug it in

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

---

**Exemplar 3**

(2 Marks)

A) Answer: ________  

B) It is not right angle which eliminates a and d. It has 3 sides which means cosine law.

Mark: 2 out of 2  
**Rationale:**  
- Correct answer in Part A (1 mark)  
- Correct justification in Part B (1 mark)
Bob is building a brick wall using rectangular bricks.

State 2 properties of polygons that allow for a rectangular wall to be completed using the bricks.

Note: Place one response per line.

Property 1: ________________________________

Property 2: ________________________________

Sample answers:
- Opposite sides are the same length
- Opposite sides are parallel
- Four right angles
- Diagonals are congruent

(2 × 1 mark)

Note to marker: Award a maximum mark of 1 mark for each line.
Exemplar 1 (2 Marks)

Property 1: because all sides are equal

Property 2: 

Mark: 0 out of 2
Rationale: - Incorrect response

Exemplar 2 (2 Marks)

Property 1: parallel sides the same

Property 2: Flat edges

Mark: 1 out of 2
Rationale: - One correct response (parallel sides) (1 mark)

Exemplar 3 (2 Marks)

Property 1: opposite sides lengths or widths are equal

Property 2: angles fit together because they are all 90°

Mark: 2 out of 2
Rationale: - Two correct responses (2 x 1 mark)
Consider a regular polygon with 17 sides.

A) State the number of diagonals in this polygon. (1 mark)

Answer:

\[ D = \frac{n(n-3)}{2} \]
\[ = \frac{17(17-3)}{2} \]
\[ = 119 \text{ diagonals} \leftarrow 1 \text{ mark} \]

B) State the central angle of this polygon. (1 mark)

Answer:

\[ C = \frac{360^\circ}{n} \]
\[ = \frac{360^\circ}{17} \]
\[ = 21.18^\circ \leftarrow 1 \text{ mark} \]

Note to marker: Allow for various roundings. Units are not required.
Exemplar 1

A) \[ \frac{360}{17} = 21.17 = 22 \]

B) 

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

Exemplar 2

A) \[ D = \frac{n(n-3)}{2} \]
\[ D = \frac{17(17-3)}{2} \]
\[ D = \frac{17 \times 3}{2} \]
\[ D = 25.5 \]

B) \[ C = \frac{360^\circ}{n} \]
\[ C = \frac{360^\circ}{17} \]
\[ C = 21.17 \]

Mark: 1 out of 2
Rationale: - Incorrect answer in Part A
- Correct answer in Part B (1 mark)

Exemplar 3

A) \[ \frac{17(17)}{2} = \text{119 DIAGONALS} \]

B) \[ \frac{360}{17} = 21.17 \]

Mark: 2 out of 2
Rationale: - Correct answer in Part A (1 mark)
- Correct answer in Part B (1 mark)
A regular dodecagon is a 12-sided figure.

A) State the sum of the interior angles. (1 mark)

Answer:

\[ S = 180^\circ (n - 2) \]
\[ = 180^\circ (12 - 2) \]
\[ = 180^\circ (10) \]
\[ = 1800^\circ \quad \leftarrow 1 \text{ mark} \]

B) State the measure of one interior angle. (1 mark)

Answer:

\[
\text{Interior angle} = \frac{1800}{n}
\]
\[ = \frac{1800}{12} \]
\[ = 150^\circ \quad \leftarrow 1 \text{ mark} \]

OR

Central angle: \[ \frac{360^\circ}{n} = 30^\circ \]

Angle at base of triangle: \[ \frac{180 - 30}{2} = 75^\circ \]

Interior angle: \[ 75 \times 2 \]
\[ = 150^\circ \quad \leftarrow 1 \text{ mark} \]

Note to marker: Units are not required.
Exemplar 1

(2 Marks)

A) \[ 18 \circ \div (12 - 2) = 0 \]

B)

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

Exemplar 2

(2 Marks)

A) \[ 180^\circ (12 - 2) = 1800^\circ \]

B) \[ 30^\circ \]

Mark: 1 out of 2
Rationale: - Correct answer in Part A (1 mark)
- Incorrect answer in Part B

Exemplar 3

(2 Marks)

A) \[ 180^\circ (12 - 2) \]

\[ \frac{1800^\circ}{12} = 150^\circ \]

B) \[ 150^\circ \]

Mark: 2 out of 2
Rationale: - Correct answer in Part A (1 mark)
- Correct answer in Part B (1 mark)
A kite is a type of polygon. State 2 properties of this polygon.

Note: Place one response per line.

Property 1: .................................................................

Property 2: .................................................................

Sample answers:

- Diagonals intersect at 90°
- Two pairs of adjacent congruent sides
- Angles between unequal sides are equal
- One of the diagonals bisects the other diagonal

(2 × 1 mark)

Note to marker: Award a maximum mark of 1 mark for each line.
**Exemplar 1**

<table>
<thead>
<tr>
<th>Property 1: equal lengths</th>
<th>Property 2: equal angles</th>
</tr>
</thead>
</table>

**Mark:** 0 out of 2  
**Rationale:** Two incorrect responses

**Exemplar 2**

Property 1: All sides have on equal other side  
Property 2: can determine the angle if needed to

**Mark:** 1 out of 2  
**Rationale:** One correct response (sides—as marked on the diagram) (1 mark)

**Exemplar 3**

Property 1: opposite sides have equal length  
Property 2: measure of consecutive angles are not equal

**Mark:** 1 out of 2  
**Rationale:** One correct response (angles) (1 mark)
State the precision and uncertainty of the oven thermometer shown below.

Precision: __________________

Uncertainty: __________________

**Answer:**

Precision: ___________ $100^\circ F$ ← 1 mark

Uncertainty: ___________ $50^\circ F$ ← 1 mark

(2 × 1 mark)

**Note to marker:** Units are not required.
**Exemplar 1** (2 Marks)

Precision: 5.0

Uncertainty: 3.5

Mark: 0 out of 2
Rationale: Two incorrect answers

**Exemplar 2** (2 Marks)

Precision: 1

Uncertainty: $\frac{1}{2} \pm 0.5$

$350 \pm 0.5$

Mark: 1 out of 2
Rationale: One correct answer (uncertainty) (follow-through error) (1 mark)

**Exemplar 3** (2 Marks)

Precision: 100

Uncertainty: 50

Mark: 2 out of 2
Rationale: Two correct answers (2 x 1 mark)
A student measured a piece of rope using 5 different measuring tapes with the same precision. He recorded the following measurements:

| 5.34 m | 5.32 m | 5.37 m | 5.34 m | 5.38 m |

State the precision of the measuring tapes.

**Answer:**

0.01 m (units are not required) or 1 cm (units are required) ← 1 mark
Exemplar 1

1 mm

Mark: 0 out of 1
Rationale: Incorrect answer

Exemplar 2

\[
\begin{array}{c|c|c|c|c|c}
5.34 \text{ m} & + & 5.32 \text{ m} & + & 5.37 \text{ m} & + & 5.34 \text{ m} & + & 5.38 \text{ m} \\
\end{array}
\]

= 5.35

Mark: 0 out of 1
Rationale: Incorrect answer

Exemplar 3

0.01

Mark: 1 out of 1
Rationale: Correct answer
The speed limit in a school zone is 30 km/h. Evan’s speedometer reads 30 km/h. Explain why Evan may be pulled over for exceeding the speed limit using one of the following concepts: accuracy, tolerance, uncertainty, or precision.

**Sample answers:**

- Evan’s speedometer could be inaccurate.
- The speedometer’s reading has an uncertainty of 5 km/hr.
- The officer’s radar instrument may not be calibrated accurately.
- The officer’s radar instrument may have a very low tolerance for speeding (e.g., 30 km $\pm$ 5 km/hr).
Exemplar 1

**Exemplar 1**

(1 Mark)

**Exemplar 1**

Evan's speedometer might be wrong.

Mark: 0 out of 1
Rationale: - Insufficient response

Exemplar 2

(1 Mark)

**Exemplar 2**

Because cops can be mean.

But seriously the speedometer could be off by ± 1 km

Mark: 1 out of 1
Rationale: - Correct response

Exemplar 3

(1 Mark)

**Exemplar 3**

Because it might not be very accurate

Mark: 1 out of 1
Rationale: - Correct response
A company makes sticks for frozen fruit snacks with a measurement of 15.5 cm ±0.2 cm.

A) State the maximum length. (1 mark)

Answer:
15.5 cm

B) State the minimum length. (1 mark)

Answer:
15.3 cm

Note to marker: Units are not required.
### Exemplar 1

(2 Marks)

A) \(15.5 + 0 = 15.5\)

B) \(15.5 - 0.2 = 15.3\)

Mark: 1 out of 2
Rationale:  
- Correct answer in Part A (1 mark)
- Incorrect answer in Part B

### Exemplar 2

(2 Marks)

A) \(15.7\)

B) \(15.3\)

Mark: 1 out of 2
Rationale:  
- Incorrect answer in Part A
- Correct answer in Part B (1 mark)

### Exemplar 3

(2 Marks)

A) \(15.5\)

B) \(15.3\)

Mark: 2 out of 2
Rationale:  
- Correct answer in Part A (1 mark)
- Correct answer in Part B (1 mark)
Rajiv places 4 boxes side by side. Each box is built to measure $12'' \pm \frac{1}{32}''$ in width. Calculate the combined width of the boxes in the format: measurement ± uncertainty

\[
\begin{align*}
12'' & \pm \frac{1}{32}'' \\
12'' & \pm \frac{1}{32}'' \\
12'' & \pm \frac{1}{32}'' \\
12'' & \pm \frac{1}{32}'' \\
\hline
48'' & \pm \frac{4}{32}'' \\
\end{align*}
\]

1 mark 1 mark

**Note to marker:** Units are not required.
Exemplar 1

\[48 \div 128\]
\[32 \times 4 = 128\]

Mark: 0 out of 2
Rationale: - Incorrect measurement
- Incorrect uncertainty

Exemplar 2

Total width = 48.0 in ± 0.5 in

Mark: 1 out of 2
Rationale: - Correct measurement (1 mark)
- Incorrect uncertainty

Exemplar 3

\[
\frac{12'' \pm 0.03125}{12.03125 + 11.96875} = \frac{22}{22} = 1.2
\]

Total width = 48" ± 1/32

Mark: 1 out of 2
Rationale: - Correct measurement (1 mark)
- Incorrect uncertainty
Nikolai received a test score of 84%. He was told he scored in the 95th percentile.

A) Explain what his test score indicates. (1 mark)

*Sample answer:*

The test score represents the percentage of points that Nicolai was awarded for the questions that he answered correctly.

B) Explain what his percentile rank indicates. (1 mark)

*Sample answers:*

Nicolai’s percentile rank indicated that he did better than 95% of the people in his class on the test.

*OR*

Nicolai’s percentile rank indicates that 5% of the people in his class did better than him.
Exemplar 1

A) that he got 84% of it correct

B) that he scored better than 95 other people

Mark: 1 out of 2
Rationale: - Correct response in Part A (1 mark)
- Incorrect response in Part B

Exemplar 2

A) it means that 84% was 95th percentile

B) if there were 100 people you would have scored higher than 95 of them

Mark: 1 out of 2
Rationale: - Incorrect response in Part A
- Correct response in Part B (1 mark)

Exemplar 3

A) His test score indicates how he did on the test.

B) His percentile rank indicates how he did overall in the class on the test.

Mark: 2 out of 2
Rationale: - Correct response in Part A (1 mark)
- Correct response in Part B (1 mark)
Athena is trying to calculate her final mark on her test. The table below shows the percent she received and the weightings for each category.

<table>
<thead>
<tr>
<th>Category</th>
<th>% correct</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple choice</td>
<td>87%</td>
<td>50%</td>
</tr>
<tr>
<td>Short answer</td>
<td>61%</td>
<td>20%</td>
</tr>
<tr>
<td>Long answer</td>
<td>68%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Calculate Athena’s final mark using a weighted mean.

**Answer:**

\[
\text{Final mark: } \frac{87 \times 0.50 = 43.5}{61 \times 0.20 = 12.2} \quad \leftarrow 1 \text{ mark for process} \\
\frac{68 \times 0.30 = 20.4}{= 76.1\%} \quad \leftarrow 1 \text{ mark}
\]

**Note to marker:** Allow for various roundings. Units are not required.
### Exemplar 1

(2 Marks)

\[ 87 \times 0.5 = 43.5 \]
\[ 61 \times 0.2 = 18.3 \]
\[ 68 \times 0.3 = 20.4 \]

\[ 43.5 + 18.3 + 20.4 = 82.2\% \]

**Mark:** 1 out of 2  
**Rationale:**  
- Incorrect process  
- Correct final mark (follow-through error) (1 mark)

### Exemplar 2

(2 Marks)

\[ 87 \times 0.5 = 43.5 / 50 \]
\[ 61 \times 0.2 = 12.2 / 20 \]
\[ 68 \times 0.3 = 20.4 / 30 \]

\[ 76.1 / 100 \]

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

### Exemplar 3

(2 Marks)

\[ 87\% \times 0.5 = 43.5 \]
\[ 12.2 \]
\[ 20.4 \]
\[ = 76.1\% \]

**Mark:** 2 out of 2  
**Rationale:**  
- Correct process (1 mark)  
- Correct final mark (1 mark)
The following set of data represents the number of homeruns hit by 9 players on a baseball team:

| 62 | 14 | 25 | 7  | 48 | 31 | 14 | 47 | 4  |

State the mean, median, and mode.

Mean: ________________

Median: ________________

Mode: ________________

Answer:

Mean: ______ 28 ______ ← 1 mark

Median: ______ 25 ______ ← 1 mark

Mode: ______ 14 ______ ← 1 mark
### Exemplar 1

| 62 | 14 | 25 | 7 | 38 | 31 | 14 | 47 | 48 | 4 |

Mean: \( \frac{62 + 14 + 25 + 7 + 38 + 31 + 14 + 47 + 48 + 4}{10} = \frac{252}{10} = 25.2 \)

Median: 14

Mode: 14, 62

Mark: 1 out of 3
Rationale: One correct answer (median) (1 mark)

### Exemplar 2

| 14 | 7 | 14 | 14 | 75 | 31 | 14 | 48 | 31 | 62 |

Mean: \( \frac{14 + 7 + 14 + 14 + 75 + 31 + 14 + 48 + 31 + 62}{10} = \frac{252}{10} = 28 \)

Median: 14

Mode: 25

Mark: 1 out of 3
Rationale: One correct answer (mean) (1 mark)

### Exemplar 3

| 62 | 14 | 25 | 7 | 48 | 31 | 14 | 47 | 48 | 62 |

Mean: \( \frac{62 + 14 + 25 + 7 + 48 + 31 + 14 + 47 + 48 + 62}{10} = \frac{252}{10} = 25.2 \)

Median: 25

Mode: 14

Mark: 2 out of 3
Rationale: Two correct answers (median, mode) (2 x 1 mark)
Jimbo has the following marks on his tests:

| 41% | 78% | 84% | 69% | 75% |

A) Explain why he might ask that his test mark be calculated using a trimmed mean. (1 mark)

**Sample answers:**

- *His mark of 41 will drag his average down.*
- *Removing the lowest and the highest mark could leave behind the marks that more accurately represent his understanding.*
- *The mean is 69.4 and the trimmed mean is 74 so he would ask for the higher mark.*

B) Calculate his trimmed mean if the teacher agrees and trims his highest and lowest test marks. (2 marks)

**Answer:**

\[
\text{Trimmed mean: } \frac{69 + 75 + 78}{3} = \frac{222}{3} = 74\% \\
\text{← 1 mark for process} \\
\text{← 1 mark}
\]

**Note to marker:** *Units are not required.*
**Exemplar 1**

(3 Marks)

A) To calculate his higher test scores only.

B) \( \frac{69 + 75 + 78}{3} = 74 \)

Mark: 2 out of 3

Rationale: - Incorrect response in Part A
- Correct process in Part B (1 mark)
- Correct final answer in Part B (1 mark)

**Exemplar 2**

(3 Marks)

A) 41, 78, 84, 69, 75 = 347 ÷ 5 = 69.4
   78, 84, 69, 75 = 306 = 76.5

   Eliminating the lowest mark gave Jimbo a better mark because
   this mark wasn’t really as important as the others which
   boosted.

B) 78, 84, 69, 75 = 306 ÷ 4 = 76.5%

Mark: 2 out of 3

Rationale: - Correct response in Part A (1 mark)
- Incorrect process in Part B
- Correct final answer in Part B (follow-through error) (1 mark)

**Exemplar 3**

(3 Marks)

A) because he only has 1 bad test

B) \( \frac{78 + 69 + 75}{3} = 222 \)

Mark: 3 out of 3

Rationale: - Correct response in Part A (1 mark)
- Correct process in Part B (1 mark)
- Correct final answer in Part B (1 mark)
Choose the letter that best completes the statement below.

The measure of central tendency that is most affected by outliers is:

a) mode  
b) mean  
c) median  
d) trimmed mean

**Answer:**  \( b \)
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Appendix:

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 (all “NR”) 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: ________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

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Follow-up: ________________________________________________________________

_____________________________________________________________________

Decision: ______________________________________________________________

_____________________________________________________________________

Marker’s Signature: ______________________________________________________

Principal’s Signature: ____________________________________________________

For Department Use Only—After Marking Complete
Consultant: ______________________________________________________________
Date: ________________________________________________________________