

Grade 12  
Essential Mathematics  
Achievement Test

# **Marking Guide**

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# Marking Guidelines

The *Grade 12 Essential Mathematics Achievement Test: Marking Guide (January 2014)* is based on *Grades 9 to 12 Mathematics: Manitoba Curriculum Framework of Outcomes (2009)*.

**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 scores.
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:

Test Item  
Number

Maximum Number  
of Marks Allotted

This section presents the test item as it appears in the student booklet, including how marks should be allotted.

**Question 2**

(2 Marks)

Test Item and Marking Guide

Determine the monthly payment for a mortgage of \$235 000 at an interest rate of 4% for a period of 25 years.

*Answer:*

$$\frac{\$235\,000}{1000} \times \underbrace{5.26}_{1 \text{ mark}} = \underbrace{\$1236.10}_{1 \text{ mark}}$$

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

This section presents student sample responses with the mark(s) allotted and the rationale justifying the mark(s) allotted.

**Exemplar 2**

(2 Marks)

$$4.00\% = 5.26$$

$$235\,000 \times 0.04 = 9400$$

$$9400 \div 5.26 = 1787/\text{month}$$

**Mark: 1 out of 2**

**Rationale:** - Correct table value (1 mark)

# Home Finance

## Question 1

(4 Marks)

Carrie is thinking of purchasing a house. The monthly mortgage payment, heating cost, and property tax would be \$836.25, \$150, and \$135, respectively. Carrie has a gross monthly income of \$2800.

A) Determine Carrie's Gross Debt Service Ratio (GDSR). (3 marks)

**Answer:**

$$GDSR = \frac{\text{Monthly Mortgage Payment} + \text{Monthly Property Taxes} + \text{Monthly Heating Costs}}{\text{Gross Monthly Income}} \times 100$$

$$= \left( \frac{\$836.25 + \$135 + \$150}{\$2800} \right) \times 100$$

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

$$= 40\%$$

← 1 mark

B) Explain whether Carrie can afford to purchase this house. (1 mark)

**Sample answers:**

- No, GDSR should be 32% or less
- No, Carrie is spending too much money compared to her income
- No, Carrie does not make enough money

**Exemplar 1**

(4 Marks)

A)  $836.25 + 150 + 135 = 1121.25$

$$2800 \div 1121.25 = \cancel{249.72}$$

$$= 2.49 \times 100 = \cancel{249.72}$$

$$\text{GDSR} = \frac{836.25 + 150 + 135}{2800} = 2.49 \times 100$$
$$= \underline{\cancel{249.72}}$$

B) Carrie can't afford the house because it takes about 69% of her monthly income which leaves her with only 31% for the other life necessities.

**Mark: 2 out of 4**

**Rationale:** - All correct substitutions in Part A (2 marks)  
- Incorrect answer in Part B

**Exemplar 2**

(4 Marks)

A)

$$\text{Monthly mortgage} = \$836.25$$

$$\text{Heating} = \$150$$

$$\text{Property tax} = \$135$$

$$\text{Monthly income} = 2800$$

$$\text{GDSR} = \frac{100 (\text{monthly mortgage} + \text{monthly property tax} + \text{heating})}{\text{gross monthly income}}$$

$$\text{GDSR} = \frac{100 (836.25 + 135 + 150)}{2800}$$

$$\text{GDSR} = 29.96$$

B) Carrie can purchase the house because her GDSR is under 32%

**Mark: 3 out of 4**

**Rationale:** - All correct substitutions in Part A (2 marks)  
- Correct answer in Part B (follow-through error) (1 mark)

**Exemplar 3**

(4 Marks)

A)

$$\frac{\$1121.25}{2800} = 0.4004 \times 100 = 40.04$$

B) She can't afford this place because she wouldn't have much money to get the things she needs such as food etc.

**Mark: 4 out of 4**

**Rationale:** - Correct solution in Part A (3 marks)  
- Correct answer in Part B (1 mark)

**Question 2**

(2 Marks)

Determine the monthly payment for a mortgage of \$235 000 at an interest rate of 4% for a period of 25 years.

*Answer:*

$$\frac{\$235\,000}{1000} \times \underbrace{5.26}_{1\text{ mark}} = \underbrace{\$1236.10}_{1\text{ mark}}$$

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



**Exemplar 1**

(2 Marks)

$$\begin{array}{r} 5.26 \times 235 = 1236.1 \\ + 235\,000 \\ \hline 236\,236.1 \end{array}$$

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

(2 Marks)

$$\begin{aligned} 4.00\% &= 5.26 \\ 235\,000 \times 0.04 &= 9400 \\ 9400 \div 5.26 &= 1787/\text{month} \end{aligned}$$

**Mark: 1 out of 2****Rationale:** - Correct table value (1 mark)**Exemplar 3**

(2 Marks)

$$\$6.04 \times 235 = \$1419.40$$

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

**Question 3**

(2 Marks)

State two (2) examples of emergency home repair costs.

*Sample answers:*

- *replace leaking hot water tank*
- *fix leaking roof*
- *replace broken window/door*
- *fix refrigerator*
- *fix leaking toilet*
- *fix/replace furnace (loss of heating)*

*(2 × 1 mark)*

**Exemplar 1**

(2 Marks)

*the replacement of an appliance?  
and the replacement of a furniture?*

**Mark: 0 out of 2****Rationale:** - Incorrect responses (“appliance” too vague)**Exemplar 2**

(2 Marks)

*The two examples of emergency home repair are:*

- Natural disaster (tornado, flooding)*
- Gas tank dangerously damaged (fuels the stove, heats the water)*

**Mark: 1 out of 2****Rationale:** - One correct response (gas tank) (1 mark)**Exemplar 3**

(2 Marks)

*basement flood, replace carpet*

*kitchen fire, replace damaged items*

**Mark: 2 out of 2****Rationale:** - Two correct responses ( $2 \times 1$  mark)

**Question 4**

(4 Marks)

Calculate the total cost of insurance for a house valued at \$250 000 with comprehensive insurance in Area 3 and a \$500 deductible.

**Answer:**

First \$200 000:                      \$799                      ← 1 mark

Next \$50 000:                       $\frac{\$50\,000}{1000} \times \underbrace{3.91}_{1\text{ mark}} = \underbrace{\$195.50}_{1\text{ mark}}$

Total:                                      \$799 + \$195.50  
= \$994.50                      ← 1 mark

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

**Exemplar 1**

(4 Marks)

 $\$994.50$ **Mark: 1 out of 4****Rationale:** - Correct answer (1 mark)**Exemplar 2**

(4 Marks)

 $799$  $200\ 000 \div 1000 = 200 \times 3.91 = 782$  $\text{insurance} = 799 + 782 = \text{insurance cost} = \$1581$ **Mark: 3 out of 4****Rationale:** - Correct amount for first \$200 000 (1 mark)  
- Correct table value (1 mark)  
- Incorrect number of 1000s  
- Correct answer (follow-through error) (1 mark)**Exemplar 3**

(4 Marks)

 $799 + (50 \times 3.91)$  $= 994.5/\text{month}$ **Mark: 3 out of 4****Rationale:** - Correct amount for first \$200 000 (1 mark)  
- Correct amount for next \$50 000 ( $2 \times 1$  mark)  
- Conceptual error (month included)

**Question 5**

(4 Marks)

A property has a portioned assessment of \$120 000 and has 60 feet of frontage. The municipal mill rate is 13.01 mills. There is a special lighting levy of \$3.50 per foot of frontage. Education taxes are \$1903.20 and there is a Provincial Property Tax Credit of \$750. Calculate the total taxes due for this property.

**Answer:**

$$\text{Municipal tax due: } \$120\,000 \times \underbrace{\frac{13.01}{1000}}_{1 \text{ mark}} = \underbrace{\$1561.20}_{1 \text{ mark}}$$

$$\begin{aligned} \text{Total levy: } & \$3.50 \times 60 \\ & = \$210 \qquad \leftarrow 1 \text{ mark} \end{aligned}$$

$$\begin{aligned} \text{Total taxes due: } & \$1561.20 + \$210 + \$1903.20 - \$750 \\ & = \$2924.40 \qquad \leftarrow 1 \text{ mark} \end{aligned}$$

**Exemplar 1**

(4 Marks)

$$120 \times 13.01 = 1561.2$$

**Mark: 2 out of 4****Rationale:** - Correct municipal tax ( $2 \times 1$  mark)**Exemplar 2**

(4 Marks)

$$60 \times 3.50 = \$210$$

$$\frac{120\,000}{1000} \times 13.01 = \$1561.2$$

$$1903.20 + 750 = \$2653.20$$

$$\begin{array}{r} \$1561.20 \\ + 2653.20 \\ \hline \$4214.40 \end{array} + 210 = \underline{\underline{\$4424.40}}$$

**Mark: 3 out of 4****Rationale:** - Correct municipal tax ( $2 \times 1$  mark)  
- Correct total levy (1 mark)**Exemplar 3**

(4 Marks)

$$\text{Property} = \frac{120\,000}{1000} \times 13.01$$

$$= 1561.20$$

$$\text{Educational} = \frac{1903.20}{1000} \times 13.01$$

$$= \$24.76$$

$$\text{Land imp.} = 60 \times 3.50$$

$$= \$210$$

$$\$1903.20 + \$24.76 + \$210 + \$750$$

$$= \$2887.96 \text{ total cost}$$

**Mark: 3 out of 4****Rationale:** - Correct municipal tax ( $2 \times 1$  mark)  
- Correct total levy (1 mark)

**Question 6**

(2 Marks)

**Test Item and Marking Guide**

Dan would like to move out of his parents' house. He can afford \$700 per month, either for a monthly rent payment or for a monthly mortgage payment. State two (2) reasons why he should rent, rather than purchase, a place to live such as an apartment or a house.

***Sample answers:***

- *less maintenance*
- *possible shorter time/financial commitment*
- *no additional property tax*
- *no need for a down payment*
- *uncertain job situation/need to relocate*
- *availability*
- *easier to arrange quickly (less paperwork)*

*(2 × 1 mark)*



**Exemplar 1**

(2 Marks)

1. *It's more affordable*
2. *Your heating, electrical, and hydro bills are all included in rent*

**Mark: 1 out of 2****Rationale:** - One correct response (utilities included) (1 mark)**Exemplar 2**

(2 Marks)

*No debt*  
*No additional costs*

**Mark: 1 out of 2****Rationale:** - One correct response (no debt) (1 mark)**Exemplar 3**

(2 Marks)

- *When renting a place, you can move out of the apartment whenever you like. When living in a house, you have to try to sell the house and cannot just move out.*
- *With renting a place you just have to pay the rent with no mortgages. With a house, you have to get loans or mortgages to purchase the house.*

**Mark: 2 out of 2****Rationale:** - Two correct responses ( $2 \times 1$  mark)

# Probability

## Question 7

(2 Marks)

State the probability of “two out of five” as a decimal number and as a percent.

decimal number: \_\_\_\_\_

percent: \_\_\_\_\_

*Answer:*

decimal number: 0.4 ← 1 mark

percent: 40 or 40% ← 1 mark

**Test Item and Marking Guide**



**Question 8**

(4 Marks)

The probability that John will get a construction contract is 0.33. It will cost him \$25 000 to prepare his bid and, if he gets the contract, it will be worth \$100 000.

A) Determine his expected value. (3 marks)

*Answer:*

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

$$= (0.33)(75\,000) - (0.67)(25\,000) \left\{ \begin{array}{l} \text{No mark for 1 or 2 correct substitutions} \\ \text{OR} \\ \text{1 mark for 3 correct substitutions} \\ \text{OR} \\ \text{2 marks for all correct substitutions} \end{array} \right.$$

$$= \$8000 \quad \leftarrow 1 \text{ mark}$$

*OR*

$$\begin{array}{ll} \text{Average earning:} & (0.33)(100\,000) \\ & = \$33\,000 \end{array} \quad \leftarrow 1 \text{ mark}$$

$$\begin{array}{ll} \text{Expected value:} & \$33\,000 - \$25\,000 \\ & = \$8000 \end{array} \quad \leftarrow 2 \text{ marks}$$

B) Justify whether he should bid on the job, based on your answer in Part A. (1 mark)

*Answer:*

*He should bid on the job because there is a positive expected value.*

**Exemplar 1**

(4 Marks)

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

A)  $EV = 0.33(100\,000) - 0.77 \times 25\,000$   
 $EV = 33\,000 - 19\,250$   
 $EV = 13\,750$

B) John should bid on the contract.

**Mark: 1 out of 4**

**Rationale:** - Two correct substitutions in Part A  
- Correct answer in Part A (follow-through error) (1 mark)  
- Incorrect answer in Part B (no justification)

**Exemplar 2**

(4 Marks)

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

A)  $EV = \left( \frac{33}{100} \times 100\,000 \right) - \left( \frac{67}{100} \times 25\,000 \right)$   
 $EV = 33\,000 - 16\,750$   
 $EV = 16\,250$

B) He should bid on the job because his EV is  $> 0$  it means he has a good probability.

**Mark: 2 out of 4**

**Rationale:** - Three correct substitutions in Part A (1 mark)  
- Correct answer in Part A (follow-through error) (1 mark)  
- Incorrect answer in Part B

**Exemplar 3**

(4 Marks)

33%

A)  $0.33 \times 100\,000 = \$33\,000 - 25\,000$   
 $= \$8000$  is the expected value

B) He should not bid on the job because there is only a 33% chance he will get a construction contract so it's more possible for him to not get it, and if he does the expected value is only \$8000 which isn't enough.

**Mark: 3 out of 4**

**Rationale:** - Correct solution in Part A (3 marks)  
- Incorrect answer in Part B

**Question 9**

(2 Marks)

Explain the difference between odds and probability.

*Sample answers:*

- *probability compares favourable outcomes to total number of outcomes; odds compare desired outcomes to non-desired outcome*
- *odds can be greater than 1 and probability cannot*

**Exemplar 1**

(2 Marks)

probability is the chance at you winning like  $\frac{1}{2}$  is 50%  
odds would be against you

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

(2 Marks)

odds explains what will most likely happen as in events  
and probability explains what is probably going to happen  
percentage

**Mark: 0 out of 2****Rationale:** - Incorrect response**Exemplar 3**

(2 Marks)

odds are a ratio

probability is 3 out of 10, percent, fraction and decimal

**Mark: 0 out of 2****Rationale:** - Incorrect response

**Question 10**

(2 Marks)

The City of Selkirk is planning a Fun Day.

- A) The probability of it raining on Fun Day is 3 out of 24. State the odds that it will **not** rain on Fun Day. (1 mark)

*Answer:*

*21 : 3 or 21 to 3*

*Note to marker: Accept reduced ratios.*

- B) The odds for winning a prize at Fun Day are 2 : 1. State the probability of winning a prize. (1 mark)

*Answer:*

*$\frac{2}{3}$  or 67% or 0.67 or two out of three or 2 : 3*



**Exemplar 1**

(2 Marks)

- A)  $24:3$
- B) *The probability of winning a prize is 1 out of 2.*

**Mark: 0 out of 2**

**Rationale:** - Incorrect answer in Part A  
- Incorrect answer in Part B

**Exemplar 2**

(2 Marks)

- A)  $\frac{3}{24}$   $24 - 3 = 21$  there is a  $\frac{21}{24}$  chance it will not rain
- B)  $\frac{2}{3} = 0.666667$   
*There is a 0.666667 chance of winning a prize*

**Mark: 1 out of 2**

**Rationale:** - Incorrect answer in Part A  
- Correct answer in Part B (1 mark)

**Exemplar 3**

(2 Marks)

- A)  $100 - 13 = 87$   
The odds that it will not rain in Selkirk are  $\frac{21}{3}$   
no rain rain
- B)  $\frac{2}{3}$  or 33%

**Mark: 1 out of 2**

**Rationale:** - Correct answer in Part A (1 mark)  
- Incorrect answer in Part B

**Question 11**

(3 Marks)

Erwin is a farmer in rural Manitoba. There is an equal probability that a farmer in Erwin's area will plant one of two crops: wheat or canola. Erwin surveys 10 farmers in the area and finds out that 7 of them plan to plant wheat.

- A) State the theoretical probability that a surveyed farmer will plant wheat. (1 mark)

**Answer:**

$$\frac{1}{2} \text{ or } 0.5 \text{ or } 50\% \text{ or } 1 \text{ out of } 2 \text{ or } 1:2$$

- B) State the experimental probability that a surveyed farmer will plant canola. (1 mark)

**Answer:**

$$\frac{3}{10} \text{ or } 0.3 \text{ or } 30\% \text{ or } 3 \text{ out of } 10 \text{ or } 3:10$$

- C) Explain why Erwin might decide to plant canola even though most farmers in the area are planning to plant wheat. (1 mark)

**Sample answers:**

- he might know that canola has a better chance of growing on his farm
- he might believe that the price of canola will go up by the time he harvests
- he might believe that fewer farmers planting canola means less competition, giving him an advantage when selling

**Exemplar 1**

(3 Marks)

- A) 7 out of 10 farmers plan to plant wheat
- B)  $10 - 7 = 3$   
3 out of 10 farmers will plant canola
- C) He will get a better deal on seeds because most people are planting wheat and he will get a better yield

**Mark: 1 out of 3**

**Rationale:**

- Incorrect answer in Part A
- Correct answer in Part B (1 mark)
- Incorrect response in Part C

**Exemplar 2**

(3 Marks)

- A)  $\frac{7}{10}$   
50  
1:3
- B)  $\frac{3}{10}$   
50  
1:7
- C) Erwin might decide to plant canola because this way he has more buyers for him because there is less people selling the same crop as him.

**Mark: 1 out of 3**

**Rationale:**

- Incorrect answer in Part A
- Incorrect answer in Part B
- Correct response in Part C (1 mark)

**Exemplar 3**

(3 Marks)

- A)  $\frac{5}{10}$
- B)  $\frac{3}{10}$
- C) because than he will have what others won't and people will come to him to buy it

**Mark: 3 out of 3**

**Rationale:**

- Correct answer in Part A (1 mark)
- Correct answer in Part B (1 mark)
- Correct response in Part C (1 mark)

**Question 12**

(1 Mark)

A fair six-sided cube numbered from 1 to 6 is rolled. State the probability that a 4 or less (1, 2, 3, or 4) will be rolled.

*Answer:*

$\frac{4}{6}$  or 0.67 or 67% or four out of six or 4:6

*Note to marker: Accept reduced ratios.*

**Exemplar 1**

(1 Mark)

$$\begin{aligned} E_v &= \frac{4}{6} - \frac{2}{6} \\ &= \frac{2}{6} \end{aligned}$$

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

(1 Mark)

4:6 or 60% chance that a 4 or lower will be rolled.

**Mark: 0 out of 1****Rationale:** - Incorrect answer**Exemplar 3**

(1 Mark)

4 in 6  
or  
4:2 odds

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

# Vehicle Finance

## Question 13

(3 Marks)

Tom decides to buy a new car in Manitoba for \$32 400. He adds a tow package to the car for \$3000. The freight is \$650. The dealership gives him \$12 000 for his old car.

Calculate the cost, including taxes, of purchasing the new vehicle.

**Answer:**

$$\begin{aligned} \text{New car cost:} \quad & \$32\,400 + \$3000 + \$650 \\ & = \$36\,050 \quad \leftarrow 1 \text{ mark} \end{aligned}$$

$$\begin{aligned} \text{Balance owing:} \quad & \$36\,050 - \$12\,000 \\ & = \$24\,050 \quad \leftarrow 1 \text{ mark} \end{aligned}$$

$$\begin{aligned} \text{Total cost:} \quad & \$24\,050 \times 1.13 \\ & = \$27\,176.50 \quad \leftarrow 1 \text{ mark} \end{aligned}$$

**Exemplar 1**

(3 Marks)

$$\begin{array}{rcl}
 \$32\,400 \times 5\% & = & 1620 \\
 \$32\,400 \times 8\% & = & 2592 \\
 \$300 \times 5\% & = & 15 \\
 300 \times 8\% & = & 24 \\
 \$650 \times 5\% & = & 32.50 \\
 650 \times 8\% & = & 52 \\
 \hline
 \text{Total} & = & \$37\,685.50
 \end{array}$$

**Mark: 1 out of 3****Rationale:** - Correct total cost (follow-through error) (1 mark)**Exemplar 2**

(3 Marks)

$$\begin{array}{r}
 32\,400 \times 1.13 = 36\,612 \\
 \quad 3000 \\
 + \quad 650 \\
 \hline
 40\,262
 \end{array}$$

$$\begin{array}{r}
 40\,262 \\
 - 12\,000 \\
 \hline
 28\,262
 \end{array}$$

*Cost + tax of vehicle \$28 262***Mark: 2 out of 3**

**Rationale:** - Incorrect use of tax  
 - Correct new car cost (follow-through error) (1 mark)  
 - Correct balance owing (follow-through error) (1 mark)

**Exemplar 3**

(3 Marks)

$$\begin{array}{r}
 32\,400 \\
 + 3000 \\
 \hline
 650 \\
 36\,050 \\
 - 12\,000 \\
 \hline
 = 24\,050 \times 1.3 = 31\,265
 \end{array}$$

**Mark: 2 out of 3**

**Rationale:** - Correct new car cost (1 mark)  
 - Correct balance owing (1 mark)

**Question 14**

(4 Marks)

Mary borrows \$18 500 from her bank to purchase a car. The bank offers her an interest rate of 6.75% for 4 years.

A) Calculate the monthly payment. (2 marks)

*Answer:*

$$\frac{18\,500}{1000} \times \underbrace{\$23.83}_{1 \text{ mark}} = \underbrace{\$440.86}_{1 \text{ mark}}$$

B) Calculate the total amount of interest paid over the life of the loan. (2 marks)

*Answer:*

$$\begin{aligned} \text{Total paid:} \quad & \$440.86 \times 12 \times 4 \\ & = \$21\,161.28 \quad \leftarrow 1 \text{ mark} \end{aligned}$$

$$\begin{aligned} \text{Interest paid:} \quad & \$21\,161.28 - \$18\,500 \\ & = \$2661.28 \quad \leftarrow 1 \text{ mark} \end{aligned}$$

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



**Exemplar 1**

(4 Marks)

$$A) \quad \frac{18\,500}{1000} \times 23.83 = 440.85$$

$$B) \quad 18\,500 \times .0675 \times 4 = 4995$$

**Mark: 2 out of 4**

**Rationale:**

- Correct solution in Part A ( $2 \times 1$  mark)
- Rounding error not penalized in Part A
- Incorrect solution in Part B

**Exemplar 2**

(4 Marks)

$$A) \quad \frac{18\,500}{1000} \times 23.83 = 4408.55$$

$$B) \quad 4408.55 \times 48 = 211\,610.40$$

**Mark: 2 out of 4**

**Rationale:**

- Correct table value in Part A (1 mark)
- Correct total paid in Part B (follow-through error) (1 mark)

**Exemplar 3**

(4 Marks)

$$A) \quad \frac{18\,500}{1000} = 19 \times 23.83 = 452.77$$

$$452.77 \times 12 \times 4 = 21\,732.96$$

$$B) \quad \begin{array}{r} - 18\,500 \\ 3232.96 \end{array}$$

**Mark: 3 out of 4**

**Rationale:**

- Correct table value in Part A (1 mark)
- Correct solution in Part B (follow-through error) ( $2 \times 1$  mark)

**Question 15**

(2 Marks)

Dallas needs a vehicle to get to work. He has decided which vehicle he wants. State two (2) advantages of buying the vehicle, rather than leasing it.

*Sample answers:*

- *no charge for excessive distance/mileage*
- *no charge for excessive wear and tear*
- *monthly payments will provide equity*
- *less expensive in the long run if purchasing*
- *purchasing is less restrictive*

*(2 × 1 mark)*

**Exemplar 1**

(2 Marks)

- you own the car it's not someone else's
- you can decide what options you want your car to have

**Mark: 0 out of 2****Rationale:** - Incorrect responses**Exemplar 2**

(2 Marks)

- don't have to give it back
- if you buy it, you own it

**Mark: 0 out of 2****Rationale:** - Incorrect responses**Exemplar 3**

(2 Marks)

1. leasing costs you more in the end
2. you only have a certain # of km's you can drive before you have to pay more

**Mark: 2 out of 2****Rationale:** - Two correct responses (2 × 1 mark)

**Question 16**

(2 Marks)

Tom's vehicle uses 12.8 L of fuel for every 100 km driven. The cost of fuel is \$1.20/Litre. Calculate the cost of fuel for Tom to drive 3000 km.

*Answer:*

$$\begin{aligned}\text{Litres used: } & \frac{3000}{100} \times 12.8 \\ & = 384 \text{ L} \qquad \leftarrow 1 \text{ mark}\end{aligned}$$

$$\begin{aligned}\text{Total cost: } & 384 \times \$1.20/\text{L} \\ & = \$460.80 \qquad \leftarrow 1 \text{ mark}\end{aligned}$$

**Exemplar 1**

(2 Marks)

$$12.8 \div 1.20 = \$10.66$$

$$10.66 \times 30 = \$319.80$$

It would cost \$319.80 to drive 3000 km.

**Mark: 1 out of 2**

**Rationale:** - Incorrect cost per hundred  
- Correct solution (follow-through error) (1 mark)

**Exemplar 2**

(2 Marks)

$$12.8 \times 3000 = 38\ 400 \times 1.2 = \$46\ 080$$

**Mark: 1 out of 2**

**Rationale:** - Incorrect number of litres  
- Correct solution (follow-through error) (1 mark)

**Exemplar 3**

(2 Marks)

$$\frac{12.8\text{L}}{100\text{ km}} = \frac{\times}{3000\text{ km}} = 384\text{ L}$$

$$384\text{ L} \times \$1.20 = \underline{\$460.80}$$

**Mark: 2 out of 2**

**Rationale:** - Correct solution (2 × 1 mark)

**Question 17**

(4 Marks)

Robert took his vehicle in for servicing at a Manitoba dealership. The dealership charged \$90 per hour for labour. The servicing took 1.5 hours to complete. Two (2) windshield wipers were replaced at a cost of \$12 each. Four (4) winter tires were put on at a cost of \$120 each. Calculate the total cost, including tax, of the servicing.

**Answer:**

*Labour:*                       $\$90 \times 1.5$   
                                       $= \$135$                        $\leftarrow 1 \text{ mark}$

*Materials:*                       $(2 \times \$12) + (4 \times \$120)$   
                                       $= \$504$                        $\leftarrow 1 \text{ mark}$

*Subtotal:*                       $135 + 504$   
                                       $= \$639$                        $\leftarrow 1 \text{ mark}$

*Total with taxes:*               $\$639 \times 1.13$   
                                       $= \$722.07$                        $\leftarrow 1 \text{ mark}$

**Exemplar 1**

(4 Marks)

$$\begin{aligned} \$90 \text{ per hour @ } 1.5 \text{ hours} &= \$120 \\ &\quad \uparrow \text{ one full hour} \\ \text{wipers } \$12 \times 2 &= \$24 \quad + \text{ half hour} \\ \text{tires } \$120 \times 4 &= \$480 \end{aligned}$$

$$\begin{aligned} \$120 + \$24 + 480 &= \$624 \\ \$624 \times 1.13 &= \underline{\underline{\$705.12}} \end{aligned}$$

**Mark: 3 out of 4**

**Rationale:** - Incorrect labour costs  
- Correct solution (follow-through error) (3 × 1 mark)

**Exemplar 2**

(4 Marks)

$$\begin{aligned} \$90 \times 1.5 \text{ hr} &= \$135 \\ 2 \text{ wipers} \times \$12 &= \$24 \text{ (0.08)} + \$24 \text{ (0.05)} & 1.92 + 1.20 &= 3.12 + 24 = \boxed{\$27.12} \\ 4 \text{ tires} \times \$120 &= \$480 \text{ (0.08)} + 480 \text{ (0.05)} & 38.4 + 24 &= 62.4 + 480 = \$542.40 \\ 135 + 27.12 + 542.40 &= \boxed{\$704.52} \end{aligned}$$

**Mark: 3 out of 4**

**Rationale:** - Incorrect tax on labour  
- Correct solution (follow-through error) (3 × 1 mark)

**Exemplar 3**

(4 Marks)

$$\begin{aligned} \text{tot. cost of labour} &= 90 \times 1.5 + \text{GST} + \text{PST} = 135 \times 1.13 = \$152.55 \\ \text{tot. cost of parts} &= 2 \times 12 + 4 \times 120 + \text{GST} + \text{PST} = \\ &= 504 \times 1.13 = \$569.52 \\ \text{tot. cost of the repairs} &= \text{tot. cost of labour} + \text{tot. cost of parts} = \\ &= \$152.55 + \$569.52 = \$722.07 \end{aligned}$$

**Mark: 4 out of 4**

**Rationale:** - Correct solution (4 × 1 mark)

**Question 18**

(2 Marks)

State two (2) factors that determine the cost of vehicle insurance in Manitoba.

*Sample answers:*

- *type of vehicle*
- *where you drive/live (i.e., rural/urban)*
- *type of use (i.e., all purpose/pleasure/farm)*
- *driving record of owner*
- *amount of deductible*
- *3rd party liability*

*(2 × 1 mark)*



**Exemplar 1**

(2 Marks)

- whether you are a boy or girl
- what age you are (16-25 generally more)

**Mark: 0 out of 2****Rationale:** - Incorrect responses**Exemplar 2**

(2 Marks)

- a passenger vehicle versus a pickup
- new vehicles cost more than older ones

**Mark: 1 out of 2****Rationale:** - One correct response (type of vehicle) (1 mark)**Exemplar 3**

(2 Marks)

- whether it's a vehicle used for work/day to day or pleasure
- if it's used on the highway or city

**Mark: 2 out of 2****Rationale:** - Correct responses (2 × 1 mark)

**Question 19**

(1 Mark)

Tammy drives her car 20 kilometres to work each day. State the type of insurance policy Tammy will need for proper coverage.

*Answer:*

*She will need all-purpose.*

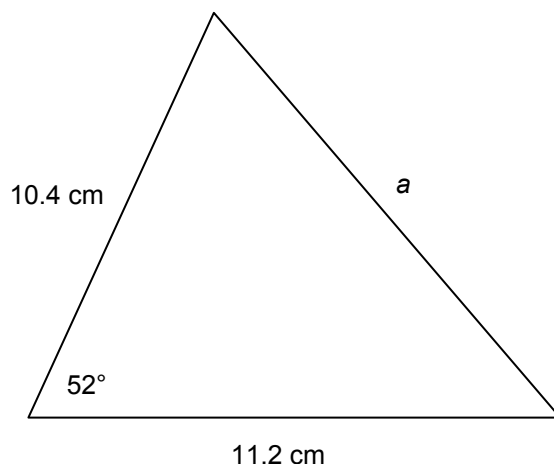


# Geometry and Trigonometry

## Question 20

(2 Marks)

Given the triangle below, calculate the length of side **a** in centimetres.



*Answer:*

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

$$a^2 = 10.4^2 + 11.2^2 - 2(10.4)(11.2)\cos 52^\circ \quad \leftarrow 1 \text{ mark for substitution}$$

$$a^2 = 108.16 + 125.44 - 143.42$$

$$a^2 = 90.18$$

$$a = \sqrt{90.18}$$

$$a = 9.5 \text{ (cm)} \quad \leftarrow 1 \text{ mark}$$

*Note to marker:* Allow for various rounding. "cm" not required.

**Exemplar 1**

(2 Marks)

$$\begin{aligned}a^2 + b^2 &= c^2 \\10.4^2 + 11.2^2 &= c^2 \\108.16 + 125.44 &= c^2 \\233.6 &= c^2 \\\sqrt{233.6} &= 15.2 \\c &= 15.2 \text{ cm}\end{aligned}$$

**Mark: 0 out of 2****Rationale:** - Incorrect solution**Exemplar 2**

(2 Marks)

$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cdot \cos \angle A \\a^2 &= 10.4^2 + 11.2^2 - 2(10.4)(11.2) \cdot \cos \angle A\end{aligned}$$

**Mark: 0 out of 2****Rationale:** - Incorrect solution**Exemplar 3**

(2 Marks)

$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cdot \cos \angle A \\a^2 &= 10.4^2 + 11.2^2 - 2(10.4)(11.2) \cdot \cos 52^\circ \\a^2 &= 108 + 125 - 144 \\a^2 &= \sqrt{89} \\a &= 9.4\end{aligned}$$

**Mark: 2 out of 2****Rationale:** - Correct solution (2 × 1 mark)

**Question 21**

(3 Marks)

**Test Item and Marking Guide**

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

A) Demonstrate one use of the Sine Law in the real world by performing the following two steps: (2 marks)

- State a specific example where Sine Law is used.
- Support your example with a written explanation of how Sine Law is used.

*Answer:*

*2 marks for example with support*

B) Sketch a reasonably neat picture or diagram (not necessarily to scale) that supports your example in Part A. (1 mark)

*Answer:*

*1 mark for sketch*

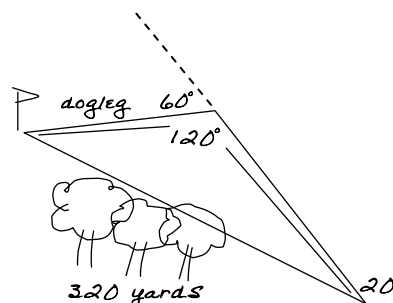
## Exemplar 1

(3 Marks)

- A) Making a golf course, there are trees in the way so you must go around,  $20^\circ$  to the right, then  $60^\circ$  left.

Find the distance of the dogleg to get to the hole.

B)



Mark: 3 out of 3

Rationale: - Correct response in Part A (2 marks)  
- Correct sketch in Part B (1 mark)

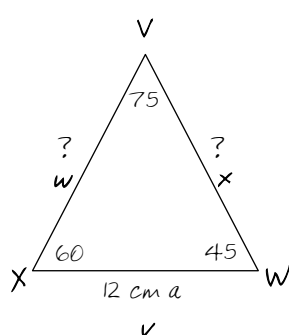
## Exemplar 2

(3 Marks)

A)

- Sine Law may be used when designing a triangular structure. To figure out dimensions & lengths.  
(Perhaps a model of a skate park.)
- The formula is  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
- Other letters may be used

B) Example: to find missing sides



$\triangle 180^\circ$

Step 1  $\frac{w}{\sin W} = \frac{x}{\sin X} = \frac{v}{\sin V}$

$$\frac{w}{\sin 45} = \frac{x}{\sin 60} = \frac{12}{\sin 75}$$

$$\frac{12}{\sin 75} = \frac{w}{\sin 45} \quad \frac{\sin 45}{\sin 75} \times 12 \quad \boxed{w = 8.8 \text{ cm}}$$

Step 2  $\frac{12}{\sin 75} = \frac{x}{\sin 60} = \frac{\sin 60}{\sin 75} \times 12 \quad \boxed{x = 10.8 \text{ cm}}$

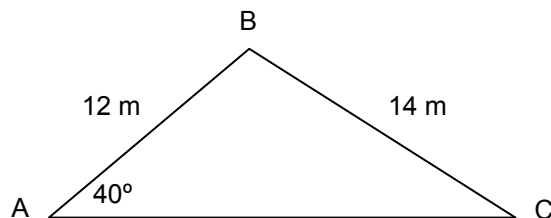
Mark: 3 out of 3

Rationale: - Correct response in Part A (2 marks)  
- Correct sketch in Part B (1 mark)

**Question 22**

(2 Marks)

Given the triangle below, calculate the measure of angle C, in degrees.



**Answer:**

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{\sin 40^\circ}{14} = \frac{\sin C}{12}$$

← 1 mark for substitution

$$\sin C = \frac{12(\sin 40^\circ)}{14}$$

$$\sin C = 0.550\ 96$$

$$\text{angle } C = \sin^{-1}(0.550\ 96)$$

$$\text{angle } C = 33.4^\circ$$

← 1 mark

**Note to marker:** Allow for various rounding. Degrees are not required.



**Exemplar 1**

(2 Marks)

$$\tan \angle C = \frac{12}{14}$$

$$\angle C = 41^\circ$$

**Mark: 0 out of 2****Rationale:** - Incorrect solution**Exemplar 2**

(2 Marks)

$$\frac{40}{14} = \frac{C}{12}$$

$$14 \cdot C = 480$$

$$C = 34.3^\circ$$

**Mark: 0 out of 2****Rationale:** - Incorrect solution**Exemplar 3**

(2 Marks)

$$\frac{\sin 40}{14} = \frac{\sin C}{12}$$

$$14 C = 7.713$$

$$C = 0.55096$$

$$C = 55^\circ$$

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

**Question 23**

(3 Marks)

**Test Item and Marking Guide**

Polygons are often used in construction, commercial, industrial, or artistic applications.

A) Demonstrate one use of the various properties of polygons in the real world by performing the following two steps: (2 marks)

- State a specific example where the various properties of polygons are used.
- Support your example with a written explanation of how the various properties of polygons are used.

*Answer:*

*2 marks for example with support*

B) Sketch a reasonably neat picture or diagram (not necessarily to scale) that supports your example in Part A. (1 mark)

*Answer:*

*1 mark for sketch*

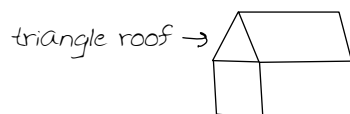
## Exemplar 1

(3 Marks)

A) Building a house

You need to have triangles to build the rafters on the roof.

B)



**Mark: 0 out of 3**

**Rationale:** - Incorrect response in Part A  
- Incorrect sketch in Part B

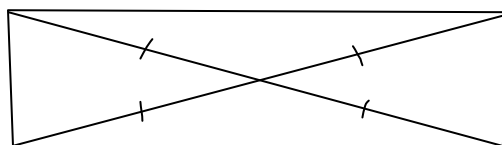
## Exemplar 2

(3 Marks)

A) CHECKING TO SEE IF THE DIAGONALS OF A WALL ARE EQUAL WHEN BUILDING A HOUSE.

IF DIAGONALS ARE EQUAL AND OPPOSITE SIDES ARE EQUAL THEN ALL ANGLES ARE  $90^\circ$ .

B)



**Mark: 3 out of 3**

**Rationale:** - Correct response in Part A (2 marks)  
- Correct sketch in Part B (1 mark)

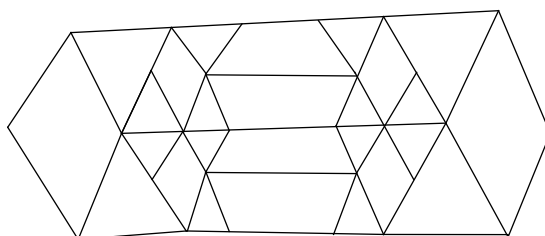
## Exemplar 3

(3 Marks)

A) Construction of stained glass windows

Various designs are made up of kites, triangles and trapezoids because the symmetry and equal measurement for each side and angle make the polygons fit together to create a hexagon.

B)



**Mark: 3 out of 3**

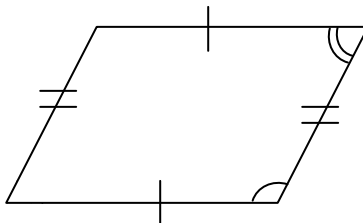
**Rationale:** - Correct response in Part A (2 marks)  
- Correct sketch in Part B (1 mark)

**Question 24**

(1 Mark)

Choose the letter that best completes the statement below.

Refer to the following diagram. It is true that:



- a) the diagonals are equal
- b) the consecutive angles are equal
- c) the diagonals are perpendicular
- d) the opposite angles are equal

*Answer:*   d)

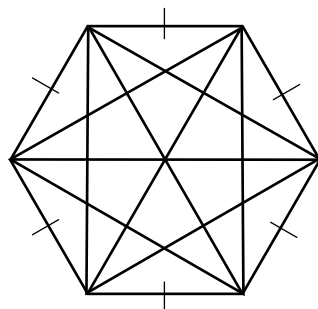


**Question 25**

(2 Marks)

Determine (by illustration or calculation) the total number of diagonals in a regular six-sided polygon.

*Answer:*



← 1 mark

*There are 9 diagonals.*

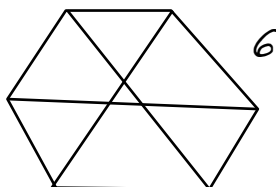
← 1 mark

*OR*

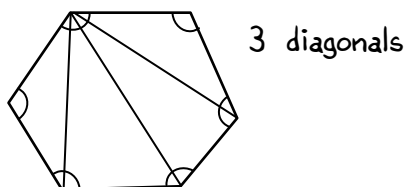
$$\begin{aligned} \text{diagonals} &= \frac{n(n-3)}{2} \\ &= \frac{6(6-3)}{2} && \leftarrow 1 \text{ mark} \\ &= \frac{6(3)}{2} \\ &= 9 \\ \therefore \text{There are 9 diagonals.} && \leftarrow 1 \text{ mark} \end{aligned}$$

**Exemplar 1**

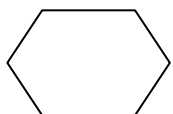
(2 Marks)

**Mark: 0 out of 2****Rationale:** - Incorrect solution**Exemplar 2**

(2 Marks)

**Mark: 0 out of 2****Rationale:** - Incorrect solution**Exemplar 3**

(2 Marks)



$$N = 6$$

$$\begin{aligned}\# \text{ of } D &= 0.5 \times N \times (N - 3) \\ &= 0.5 \times 6 \times (6 - 3) \\ &= 3 \times (3) \\ &= 9\end{aligned}$$

**Mark: 2 out of 2****Rationale:** - Correct solution (2 × 1 mark)

**Question 26**

(1 Mark)

Choose the letter that best completes the statement below.

An isosceles triangle must have

- a) a right angle
- b) two sides of the same length
- c) all angles with different measures
- d) all acute angles

*Answer:*   b)  

**Test Item and Marking Guide**





**Question 27**

(1 Mark)

A coin is in the shape of a regular polygon with 11 sides. State the measure of a central angle in degrees.



*Answer:*

$$C = \frac{360^\circ}{n}$$

$$= \frac{360^\circ}{11}$$

$$= 32.7^\circ \quad \leftarrow 1 \text{ mark}$$

*Note to marker:* Degrees are not required. Allow for various rounding.

**Exemplar 1**

(1 Mark)

$$C = \frac{360^\circ}{11} = 34^\circ$$

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

(1 Mark)

approx.  $31^\circ$ **Mark: 0 out of 1****Rationale:** - Incorrect answer**Exemplar 3**

(1 Mark)

$$\begin{array}{l} (360^\circ) \div 11 \\ = 33^\circ \end{array}$$

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

# Precision Measurement

## Question 28

(1 Mark)

Explain why a timer for a 100 m race would need to be more precise than a timer for a 10 km run.

*Answer:*

*The runners' times will be closer: smaller unit of measurement required.*

**Test Item and Marking Guide**

**Exemplar 1**

(1 Mark)

*because a 100 m is shorter while the 10 km is longer*

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

(1 Mark)

*Because it is faster and the margin of error is very small and you'd want to be more precise*

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

(1 Mark)

*shorter distance to run, increased chance of close ties, so higher specific timers are recommended.*

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

**Question 29**

(1 Mark)

**Test Item and Marking Guide**

The length of a school's garden is measured using a stick that has been cut to 1 metre in length. State the uncertainty in the measurements made using the stick.

*Answer:*

*0.5 (metre)*

*Note to marker: metre not required.*

**Exemplar 1**

(1 Mark)

*0.1 metres*

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

(1 Mark)

*$1 \div 2 = 0.5$  precision*

*$0.5 \div 2 = 0.25 = \text{uncertainty}$*

*uncertainty is 0.25 m*

**Mark: 0 out of 1****Rationale:** - Incorrect answer**Exemplar 3**

(1 Mark)

*Uncertainty: (1m +/- 0.5)*

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

**Question 30**

(2 Marks)

Describe a measurement situation and explain why a certain degree of accuracy would be required.

*Sample answers:*

- *scientist measuring amounts of chemicals to create a prescription medication, to have the desired effects on the patient*
- *carpenters must take accurate measurements to ensure clean joints in mouldings*
- *thermometer accuracy when measuring a child's body temperature, to determine their medical condition*



**Exemplar 1**

(2 Marks)

Archery: You have to have a degree of accuracy to get as close or on the bull's eye as possible.

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

(2 Marks)

With medication you don't want to give someone an overdose

**Mark: 2 out of 2****Rationale:** - Correct response (2 marks)**Exemplar 3**

(2 Marks)

Carpenter measuring a chair leg, if he doesn't hold himself to a high degree of accuracy, the chair legs may not be the desired length.

**Mark: 2 out of 2****Rationale:** - Correct response (2 marks)

**Question 31**

(2 Marks)

**Test Item and Marking Guide**

A company manufactures cylinders that must have a mass of 4.82 kg, within a tolerance of 0.24 kg.

A) State the minimum mass. (1 mark)

*Answer:*

$$\begin{aligned} &4.82 - 0.12 \\ &= 4.70 \text{ (kg)} \quad \leftarrow 1 \text{ mark} \end{aligned}$$

B) State the maximum mass. (1 mark)

*Answer:*

$$\begin{aligned} &4.82 + 0.12 \\ &= 4.94 \text{ (kg)} \quad \leftarrow 1 \text{ mark} \end{aligned}$$

*Note to marker: "kg" not required. A student using  $\pm 0.24$  will receive 0 marks for Part A and 1 mark for Part B (see Exemplar 3).*

**Exemplar 1**

(2 Marks)

A)  $4.86 - 0.24 = 4.62 \text{ kg}$

B)  $4.86 + 0.24 = 5.10 \text{ kg}$

**Mark: 0 out of 2**

**Rationale:** - Incorrect answer in Part A  
- Incorrect answer in Part B

**Exemplar 2**

(2 Marks)

A)  $4.94 \text{ kg}$

B)  $4.7 \text{ kg}$

**Mark: 0 out of 2**

**Rationale:** - Incorrect answer in Part A  
- Incorrect answer in Part B

**Exemplar 3**

(2 Marks)

A)  $4.58 \text{ kg}$

B)  $5.06 \text{ kg}$

**Mark: 1 out of 2**

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

**Question 32**

(2 Marks)

Explain why the concept of tolerance would be important when installing kitchen cabinets.

*Sample answers:*

- *to leave room for adjacent doors to open and close properly without obstruction*
- *so all of the parts of the cabinet fit together (hinge, door, shelves, etc.)*
- *so that the cabinets are functional and look good*

**Exemplar 1**

(2 Marks)

*Tolerance is important in order to know the weight that can be put on the cabinets safely.*

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

(2 Marks)

*If you exceed your tolerance you could end up losing time and money.*

**Mark: 0 out of 2****Rationale:** - Incorrect response**Exemplar 3**

(2 Marks)

*because you want them to fit the openings which can be a bit off.*

**Mark: 2 out of 2****Rationale:** - Correct response (2 marks)

# Statistics

## Question 33

(2 Marks)

The data below shows the amount of snow that fell during a 7-day period in Springfield, Manitoba.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2 cm	0 cm	1 cm	12 cm	4 cm	0 cm	3 cm

A) State the median daily snowfall for the period. (1 mark)

*Answer:*

2 (cm)

B) State the mode of daily snowfall for the period. (1 mark)

*Answer:*

0 (cm)

*Note to marker: "cm" not required.*

**Exemplar 1**

(2 Marks)

A)  $0, 0, 1, 2, 3, 4, 12$   
2

B)  $2 + 4 + 1 + 3 + 12 = 22$   
 $22 \div 7 = 3$

**Mark: 1 out of 2**

**Rationale:** - Correct answer in Part A (1 mark)  
- Incorrect answer in Part B

**Exemplar 2**

(2 Marks)

A)  $12, 4, 3, \textcircled{2}, 1, \emptyset, \emptyset$

B) Monday and Friday (0 and 0)

**Mark: 2 out of 2**

**Rationale:** - Correct answer in Part A (1 mark)  
- Correct answer in Part B (1 mark)

**Exemplar 3**

(2 Marks)

A)  $0, 0, 1, \textcircled{2}, 3, 4, 12$

B) 0 cm

**Mark: 2 out of 2**

**Rationale:** - Correct answer in Part A (1 mark)  
- Correct answer in Part B (1 mark)

## Question 34

(3 Marks)

Mrs. Themark's class of 10 students had the following results (as percents) on a recent unit test:

10	65	75	82	90
57	67	78	83	91

- A) Mrs. Themark wants to determine the class average by calculating the trimmed mean, by removing the highest and lowest result. Calculate the trimmed mean. (2 marks)

**Answer:**

$$\left. \begin{array}{l} \text{New sum: } 597 \\ \text{New number of students: } 8 \end{array} \right\} \leftarrow 1 \text{ mark for process}$$

$$\text{Trimmed mean: } \frac{597}{8} = 74.6$$

$$= 75\% \quad \leftarrow 1 \text{ mark}$$

- B) Explain why the mark of 10% could be considered an outlier. (1 mark)

**Sample answers:**

- The teacher knows that 10% is not indicative of the student's knowledge: the result is due to other factors.
- The result is very different from the others and the mean would not be indicative of the class's performance overall.



**Exemplar 1**

(3 Marks)

- A) The trimmed mean is 597
- B) It would be considered an outlier, because of how low the mark is to the rest of the mark, so it throws off the balance of the mean unless you do the trimmed mean.

**Mark: 1 out of 3**

**Rationale:** - Incorrect solution in Part A  
- Correct response in Part B (1 mark)

**Exemplar 2**

(3 Marks)

- A) ~~57~~, 65, 67, 75, 78, 82, 83, 90, ~~91~~  
Trimmed mean =  $\frac{597}{10} = 59.7\%$
- B) Because it is the smallest # and it has a greater distance in % than the others  
10%..... 57% 65%

**Mark: 2 out of 3**

**Rationale:** - Incorrect new number of students in Part A  
- Correct answer in Part A (follow-through error) (1 mark)  
- Correct response in Part B (1 mark)

**Exemplar 3**

(3 Marks)

- A)  $597 \div 8 = 74.625\%$
- B) Because it is the lowest mark out of all the rest

**Mark: 2 out of 3**

**Rationale:** - Correct solution in Part A ( $2 \times 1$  mark)  
- Incorrect response in Part B

**Question 35**

(2 Marks)

**Test Item and Marking Guide**

A student scored in the 99th percentile of her class, yet was unhappy with her test mark. Explain how she could be unhappy with this result.

*Answer:*

*Percentile doesn't indicate individual achievement/score/percentage.*

**Exemplar 1**

(2 Marks)

Being in the 99th percentile does not mean you got a good mark at all!!!  
It just means that she passed.

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

(2 Marks)

Her mark on the test wasn't very good, but all the other kids did really bad too so she placed higher.

**Mark: 2 out of 2****Rationale:** - Correct response (2 marks)**Exemplar 3**

(2 Marks)

*Because they could have all done poorly*

**Mark: 2 out of 2****Rationale:** - Correct response (2 marks)

**Question 36**

(3 Marks)

**Test Item and Marking Guide**

Fifty (50) members of a football team are weighed. Thomas weighs 165 pounds. Four (4) players weigh less than Thomas.

A) Calculate Thomas's percentile rank. (2 marks)

**Answer:**

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

$$= \frac{4}{50} \times 100 \quad \leftarrow 1 \text{ mark for correct substitution}$$

$$= 8$$

$$\therefore 8 \text{ or } 8\text{th or } P_8 \leftarrow 1 \text{ mark}$$

**Note to marker:** Accept  $\frac{4.5}{50} \times 100 = P_9$ .

B) Explain how Thomas's weight compares to the weight of the other team members. (1 mark)

**Answer:**

*8% of the team weighs less than Thomas.*

**OR**

*92% of the team weighs more than Thomas.*

**Note to marker:**

*Accept 9% of the team weighs less OR 91% weighs more than Thomas.*

**Exemplar 1**

(3 Marks)

- A) *Tied at 5 percentile*
- B) *He was one of the lighter players on the team.*

**Mark: 1 out of 3**

**Rationale:** - Incorrect solution in Part A  
- Correct response in Part B (1 mark)

**Exemplar 2**

(3 Marks)

- A)  $p = 8$
- B) *He weighs very little.*

**Mark: 1 out of 3**

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

**Exemplar 3**

(3 Marks)

- A) 
$$= \frac{b}{n} \times 100$$
$$= \frac{4}{165} \times 100$$
$$= 2.4 \rightarrow \boxed{3} \quad \text{Thomas weighs more than 3\% of the foot ball team.}$$
- B) *He weighs more than 3% of the team but 97% weigh more than him.*

**Mark: 2 out of 3**

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



# 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:** \_\_\_\_\_

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**Question(s) affected:** \_\_\_\_\_

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**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:** \_\_\_\_\_