Grade 12 Essential

Week 9 Quiz Debrief and Solutions

MrF

24-05-30

MrF

GRADE 12 ESSENTIAL
WEEK 9 QUIZ 24-05-30

Name:_____
Date: _____

Closed Book. Use your and / or Teacher Cheat Sheet. You will need *your own* cheat sheet to submit with your final exam.

Round all decimal amounts to the nearest 0.01 unless otherwise indicated (standard).

Show work, show method. Generally, just *stating* an answer gets zero marks. Use extra blank paper if necessary. Part marks possible

Time Limit: _____60 mins Several student went 90' and only got half done!

Each individual question is worth 2 marks unless otherwise indicated.

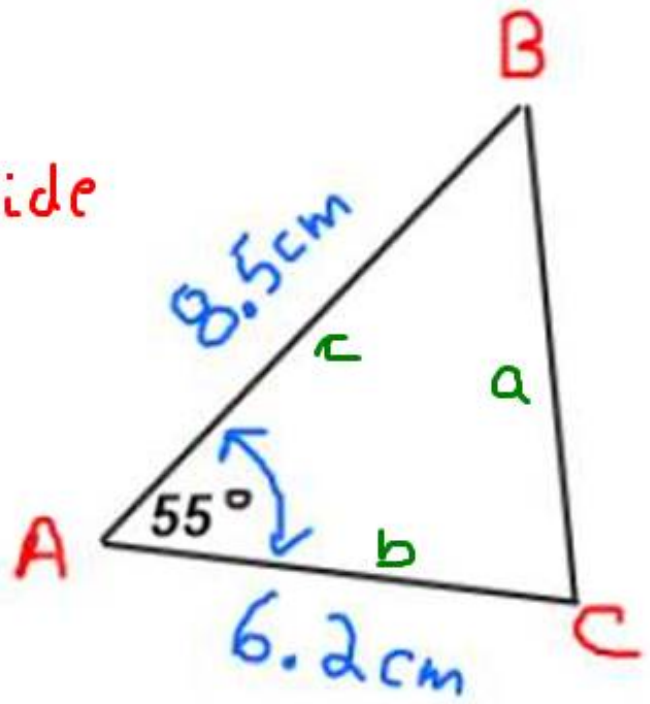
It is **possible** to get up to **150%** on this quiz if you try the Bonus Questions!

Do question 1 or 2 but not both. If you do both the other will be marked as a bonus

Many of the questions were identical to the previous quiz.
The quiz was marked out of 19, but there was 19 Bonus
Could have got 200%, but I capped it at 150%

Do question 1 or 2 but not both. If you do both the other will be marked as a bonus

1. Determine the measure of length $\overline{BC}$ *[side a]*. (3 marks)



Cos Law Side - Included Angle - side

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

$a^2 = 6.2^2 + 8.5^2 - 2 \cdot 6.2 \cdot 8.5 \cdot \cos(55)$

$a^2 = 50.235\ldots$

$a = \sqrt{ANS} = 7.09$ cm

Units! TLAR

$6.2^2 + 8.5^2 - 2 \cdot 6.2 \cdot 8.5 \cdot \cos(55)$

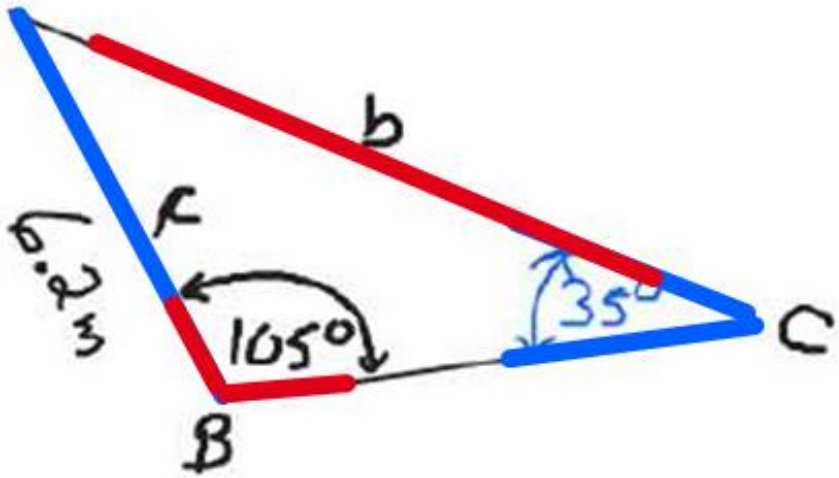
$= 50.23504360$

$\sqrt{50.2350436086}$

$= 7.087668418$

- *Label Diagram* ✔
- *Select formula* ✔
- *Write down formula* ✓
- *Plug in numbers* ✓
- *Solve* ✓
- *Check*

2. Determine the measure of side *b*. (3 Marks)



sine law [side & angle pairs]

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

$$\frac{b}{\sin(105)} = \frac{6.2}{\sin(35)}$$

~~$\sin(105)\cdot$~~ $\dfrac{b}{\sin(105)} = \dfrac{6.2}{\sin(35)} \cdot \sin(105)$

$$b = 6.2 \cdot \sin(105) / \sin(35)$$

$$b = 10.44 \text{ m}$$

TLAR ∴

↖ units

- *Label Diagram* ✓
- *Select formula* ✓
- *Write down formula* ✓
- *Plug in numbers* ✓
- *Solve* ✓
- *Check* ✓

Do question 3 or 4 but not both. If [when?] you do both the other will be marked as a bonus

3. Statistics. Determine the mean, median, and mode of the data set.

$\{2, 3, 6, 6, 9, 6, 15\}$

a. Mean, $\bar{x}$ = $\bar{x} = \Sigma x / n = 47/7 = 6.71$ TLAR

b. Median, $\tilde{x}$, = $\tilde{x} \rightarrow \{2, 3, 6, 6, 6, 9, 15\}$ $\tilde{x} = 6$

c. Mode = most frequent value(s) = 6

d. Range = $x_{max} - x_{min} = 15 - 2 = 13$

- ~~Label Diagram~~
- Select formula ✓
- Write down formula ✓
- Plug in numbers ✓
- Solve ✓
- Check

4. Statistics- Percentile Rank. Josh was writing a qualification exam for a desirable government job. He got 43 marks out of a possible 82 marks on the exam. 325 applicants wrote the exam, 292 got a worse exam score than Josh, and five *others* had the same exam score as Josh.

a. Determine Josh's mark on the qualification exam as a percent.

b. Determine Josh' Percentile Rank on the examination.

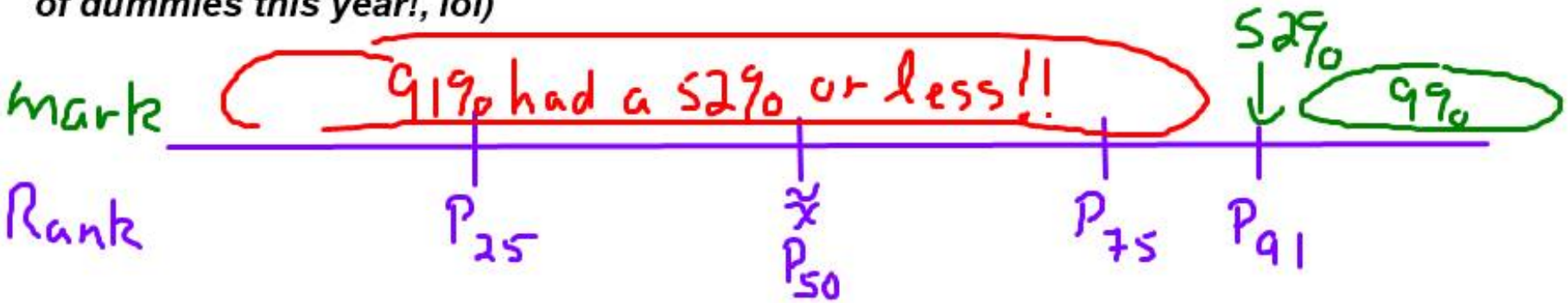
c. **Explain** (using proper grammar) whether you think the exam was likely easy or difficult. A diagram [graphic organizer] would certainly make the explanation clear too!

a) $43/82 = 0.52439\ldots = 52.44\%$ on the exam!

b) $\text{Rank} = \frac{B + \frac{1}{2}(E)}{n} \cdot 100\nearrow = \frac{[292 + \frac{1}{2}(6)]}{325} \cdot 100\nearrow$

$= 295/325 \cdot 100\nearrow = (91)$ P_{91} NOT 91%

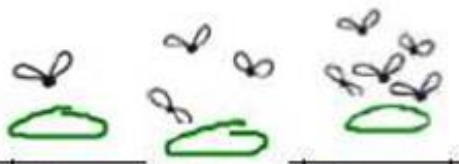
c) it must have been a really tough exam if a 52% is one of the top marks! (or maybe lots of dummies this year!, lol)



Do question 5 or 6 but not both. If [when] you do both the other will be marked as a bonus

5. Problem Solve – Use a Table. A frog is on a lily pad, it eats **one** fly on the first lily pad. It hops to a **second** lily pad and **eats *two* more** flies than eaten on the first lily pad, then it jumps to a **third** lily pad and **eats *two* more than the second** lily pad, and so on with the same pattern, so that at every lily pad it eats **two** more flies than the previous lily pad.

a. Complete the entire table: (2 marks)



Lily Pad	1	2	3	4	5	6	7	8	9	10	11 →
Flies	1	3	5	7	9	11	13	15	17	19	→
Total Eaten	1	4	9	16 Total	25	36	49	64	(81)	100	

I see a cool pattern!

b. **State** the answers to the following: (1 mark each)

a. How many total flies total will the frog have eaten when it has eaten the all the flies on the 9th lily pad? Answer: 81 total eaten

b. On which lily pad will it have eaten its 50th fly? Answer: 8

6. Problem Solve. Five years ago Karen was half of her mom's age. Karen's mom is 18 years older than Karen. Determine how old Karen is **now**. [4 marks] [*Ensure you at least show how the answer checks if making guesses]*

Guess & check? Algebra is so much more slick!

	K now	K 5 years ago	mom 5 Years Ago	mom Now	Age diff
×	20?	15	·2 = 30	+5 35	35-20 = 15 X
*	25? -5 = 20		· 2 = 40	+5 = 45	45-25=20
✓	(23)? -5 = 18		· 2 = 36	+5 = 41	41-23=18

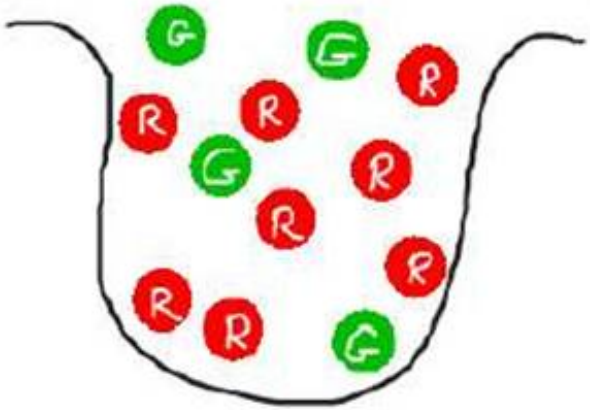
Karen is 23 today. Her mom is 18 years older and 5 years ago when Karen was 18 her mom was 36 so double Karen's age 5 years ago

Lots of other ways to tabulate your thoughts

6. Problem Solve. Five years ago Karen was half of her mom's age. Karen's mom is 18 years older than Karen. Determine how old Karen is **now**. [4 marks] [*Ensure you at least show how the answer checks if making guesses]*

There are much more effective and honestly easier ways to do this if you take more advanced Math studies

7. **Probability**. A bag contains 4 Green marbles and 8 Red marbles.

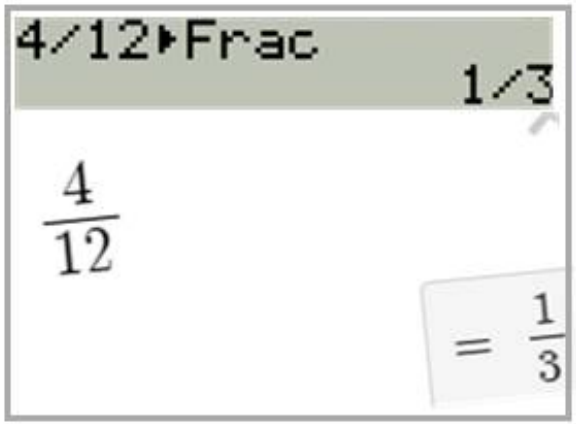


a. Determine the probability of drawing a Green Marble. [*Prob(Draw Green)*]. Express the answer as a reduced fraction **and** as a %.

b. Determine the **Odds For** drawing a RED

a) P(Green) = # of Green outcomes / total possible outcomes

= 4/12 = 1/3 = 33.33%



b) ODDS FOR Red

2 : 1

# of Red outcomes : # of NOT Red outcomes

PROBABILITY

Prob of Event A = $\frac{favoured\ outcomes}{total\ possible\ outcomes}$

my cheat sheet.

How does your's look?

Odds in Favour (For). Favoured : Unfavoured ; {wins : no wins}; (success : failure)

Odds Against. unfavoured : favoured

Eg 30% prob = 3/10 prob = 0.3 prob → 3:7 Odds in Favour → 7:3 Odds Against.

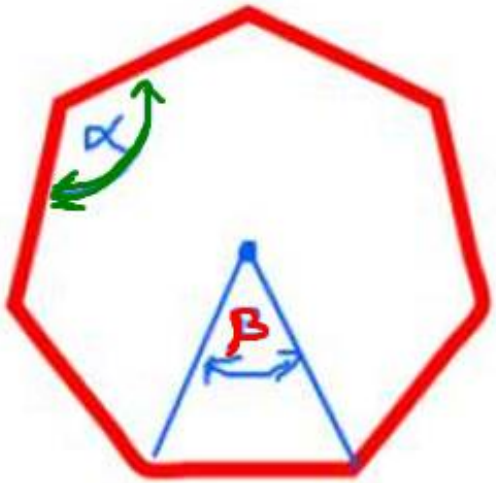
Do question either 8 or 9 .

If you do both **then you can can get extra bonus marks**

8. For the Regular 7-sided Heptagon determine the measure of:

a. central angle beta (β)

b. vertex angle alpha (α)



a) $\beta = 360°/n = 360°/7 = 51.43°$

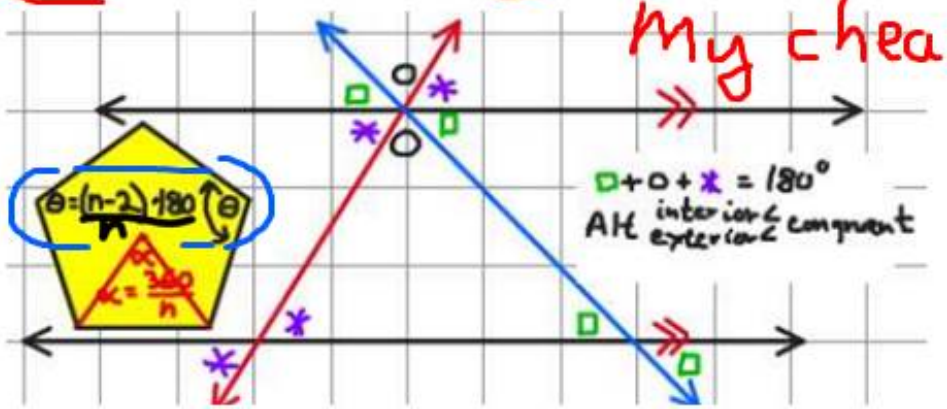
b) $\alpha = (n-2)\cdot 180°/n = (7-2)\cdot 180°/7 = 128.57°$ TLAR.

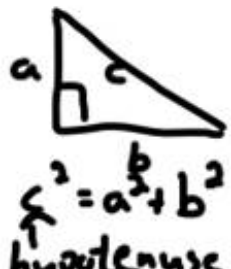
Sum of Interior Angles of a Polygon; **S = (n – 2) * 180°**; where n is the number of sides of the polygon

Central Angle of Regular Polygon Sector; **C**
$C = \frac{360°}{n}$; where n is the number of sides.

Number of Diagonals in a Polygon; **D**
$D = \frac{n(n-3)}{2}$; where n is the number of sides.

My cheat sheet



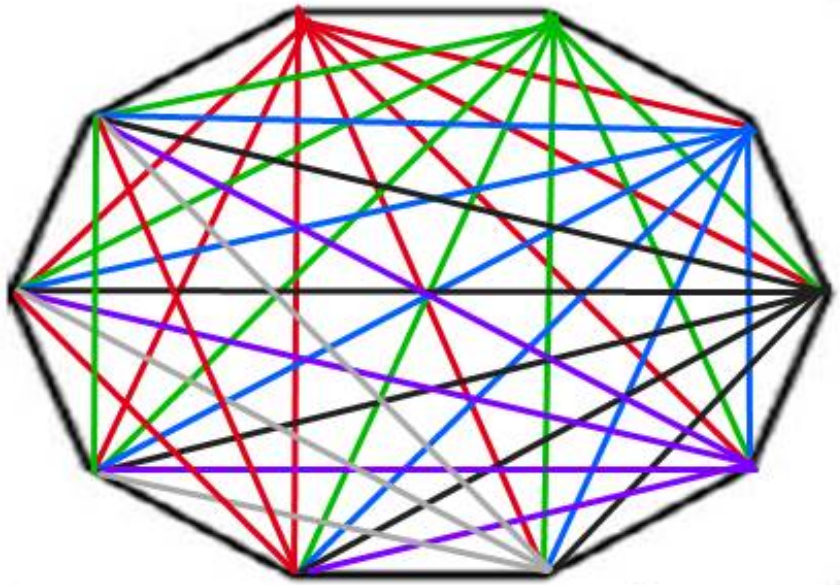


9. For this irregular 10-sided decagon determine:

a. the sum of all the interior vertex angles

b. the number of diagonals that cut across the decagon.

7
7
6
5
4
3
2
+ 1
35



a) $S = (n-2)\cdot 180^\circ = (10-2)\cdot 180^\circ = 8\cdot 180^\circ = 1440^\circ$

If we added all the inside angles.

b) $N_{diagonals} = n\cdot(n-3)/2$

$= 10\cdot(10-3)/2 = 10\cdot 7/2$

$= 35$ diagonals

or $\frac{1}{2}\cdot n\cdot(n-3)$

EVEN MORE BONUS QUESTIONS

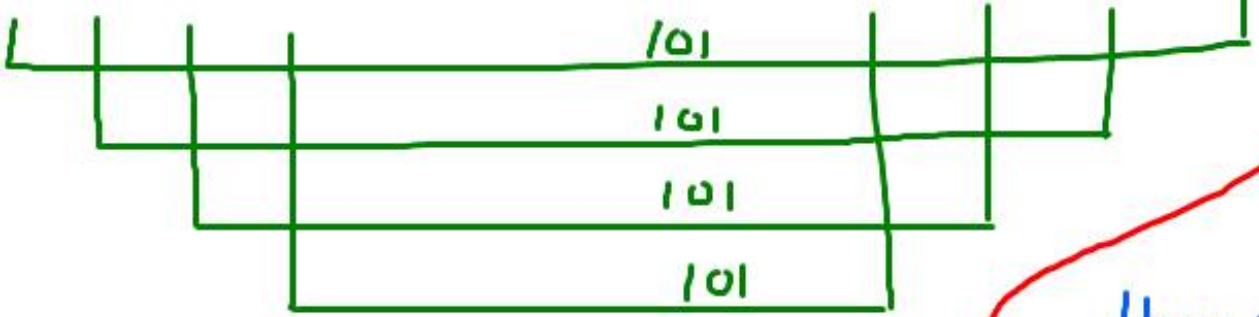
(Try them! It is possible to get 150% on this quiz)

A half dozen ways to do this, depends on how you think!

Bonus: (2 Marks)

Determine the sum of the counting numbers from 1 to 101

$1+2+3+4+\cdots$ etc $\cdots 97+98+99+100+101 = ?$



See a pattern?

How many 101's?

$50 \cdot 101 + 101$

$5050 + 101 = 5151$

Bonus. Conversion (2 Marks)

Convert \$16 / hour to how many cents per min. \$16/hr = ___ ¢ / min

$$\frac{\$16}{\text{hour}} \cdot \frac{1\ \text{hour}}{60\ \text{min}} \cdot \frac{100\ ¢}{\$1} = 26.66666$$

$$= 26.67\ ¢/\text{min}$$

If the units work out then the numbers work out tooo!

Evaluate Using a Formula. (2 Marks) The formula to convert American degrees Fahrenheit [°F] to metric degrees Celsius [°C] is given by the formula:

← 28 "plug in"

$$°C = \frac{5}{9} * (°F - 32 °);$$

Using the formula show the conversion of 28 degrees Fahrenheit (28°F) into degrees Celsius °C:

$$°C = \frac{5}{9} \cdot (28 - 32) = 5/9 \cdot (-4) = -20/9$$

$$= -2.22°C$$

Long division: 9) 20.000 = 2.222 →
18, 20, 18, 20, 18, 20, 18, 2

TLAR
In the old days 32F was freezing

$$\frac{5}{9}(28 - 32)$$

↙ negative

$$= -2.22222222$$

LOAD CLEAR !