

Grade 12 Essential

WEEK 8 QUIZ

QUIZ DEBRIEF

23 -05 -25

MrF



**GRADE 12 ESSENTIAL
WEEK 8 QUIZ**

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. Part marks possible

Time Limit: 80 mins way more than enough!

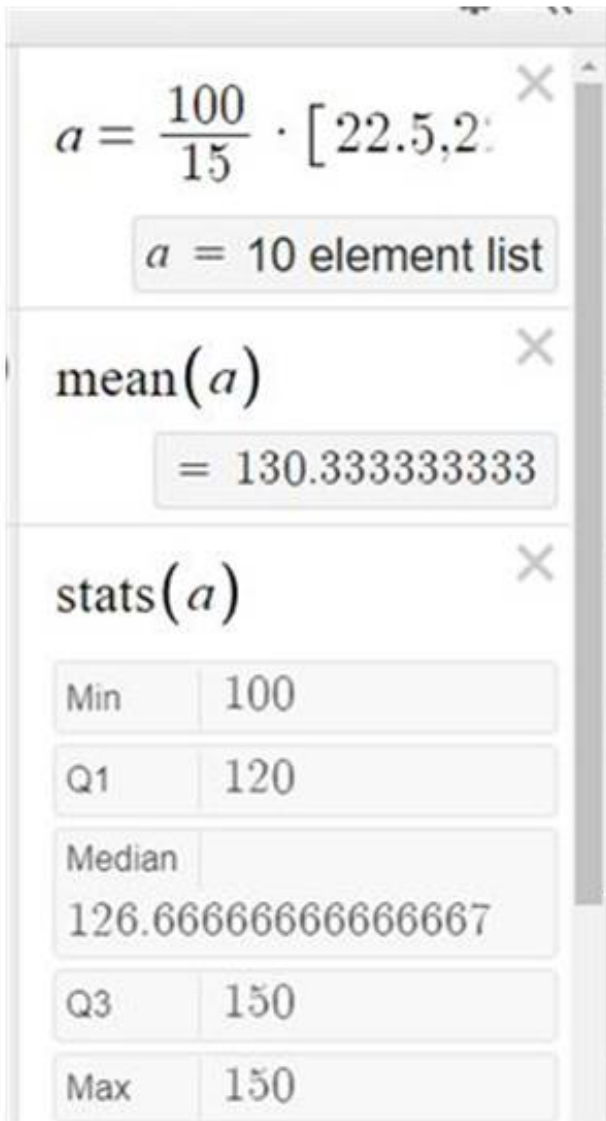
Each individual question is worth 2 marks unless otherwise indicated.

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

Quiz Stats!

Everyone who wrote it got 100% or better!

The **FINAL EXAM** is **not** this generous!!!!

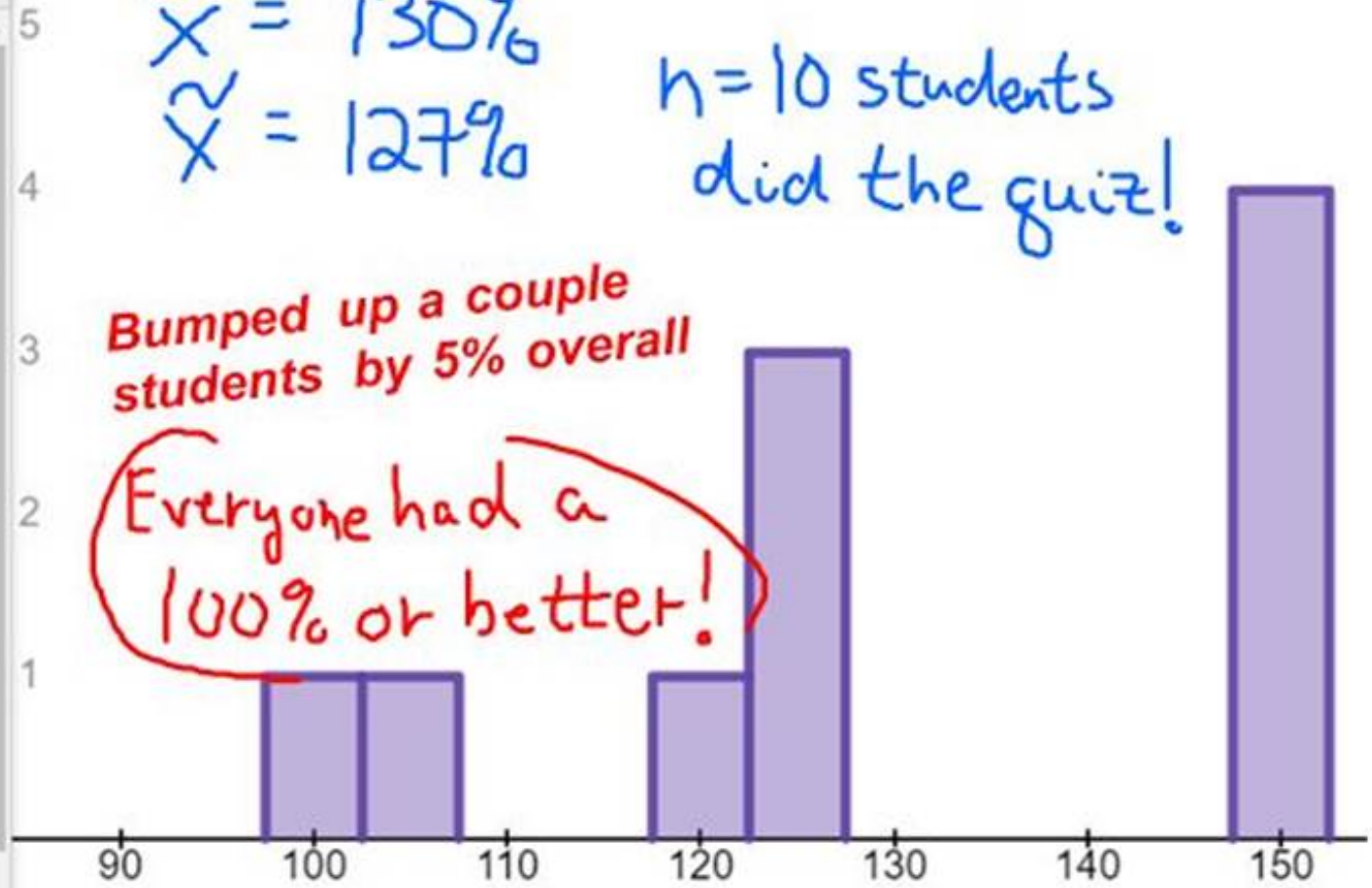


$$\bar{X} = 130\%$$
$$\tilde{X} = 127\%$$

$n = 10$ students
did the quiz!

Bumped up a couple
students by 5% overall

Everyone had a
100% or better!



Quiz 25 MAY

Do question 1 or 2 but not both. If you do both the best one will be marked.

1. Determine the measure of length a . (3 marks)

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

$$a^2 = 4^2 + 7.5^2 - 2 \cdot 4 \cdot 7.5 \cdot \cos(62)$$

$$a^2 = 4^2 + 7.5^2 - 2 \cdot 4 \cdot 7.5 \cdot \cos(62)$$

= 44.0817062328

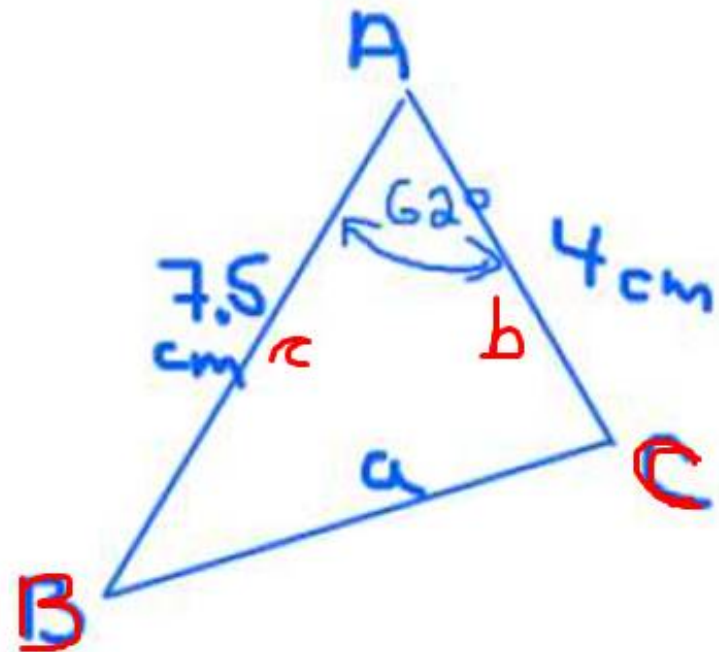
now... "un-square"

$$a = \sqrt{44.0817062328}$$

$$= 6.639405$$

$$a \approx 6.64 \text{ cm}$$

TLAR

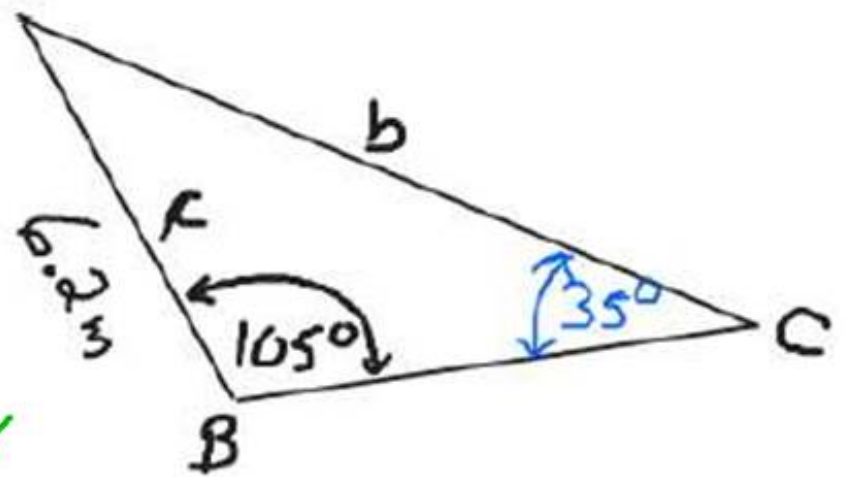


SAS
⇓
Cos law

Label ✓
Write formula ✓
Plug in numbers
Solve

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

~~cos law:~~
SAS or SSS
sin law
side & angle pairs ✓



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

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

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

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

$$b = \text{= 10.44104977}$$

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

- Label → done ✓
- Write formula ✓
- Plug in numbers
- Solve ✓
- TLAR

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

Do question 3 or 4 but not both. If you do both the best one will be marked.

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

{ 1, 3, 4, 4, 8, 4, 12 }

Mean, $\bar{x} = 5.14$

$$\bar{x} = \frac{\sum x}{n} = \frac{36}{7} \approx 5.14$$

Median, $\tilde{x} = 4$

~~{ 1, 3, 4, 4, 8, 12 }~~

happens most often

Mode = 4

↑ most frequent value!

↑↑

has to be a central value, somewhere between 1 and 12

So why did some say the mean was 37 ???

4. Statistics- Percentile Rank. Josh was writing a qualification exam for a desirable government job. He got 45 marks out of a possible 78 marks on the exam. 345 applicants wrote the exam, 288 got a worse exam score than Josh, and six others had the same score as Josh.

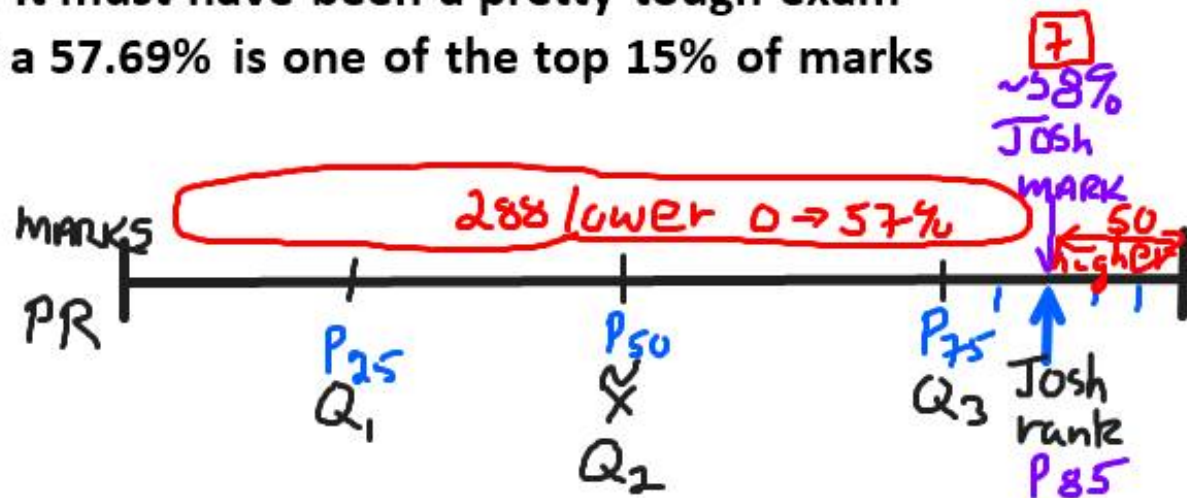
- Determine Josh's mark on the qualification exam as a percent. **57.69%**
- Determine Josh' Percentile Rank on the examination.
- Explain** (using proper grammar) whether you think the exam was likely easy or difficult.

a) Exam: $\frac{45}{78} = \frac{x}{100}$; $x = 57.69$; Exam mark = $\frac{57.69}{100} = \mathbf{57.69\%}$

b) $PR = \frac{(B + \frac{1}{2}(E))}{n} \cdot 100 = \frac{[288 + \frac{1}{2}(7)]}{345} \cdot 100 = \frac{291.5}{345} \cdot 100 = 84.49$

c. It must have been a pretty tough exam if a 57.69% is one of the top 15% of marks

Round up \uparrow **85**
P₈₅ **85th place**
NOT 85%



Do question 5 or 6 but not both. If you do both the best one will be marked.

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 **three more** flies than eaten on the first lily pad, then it jumps to a **third** lily pad and eats **three more than the previous** lily pad, and so on, so that at every lily pad it eats three more flies than the previous lily pad.

Complete the table:

Lily Pad	1	2	3	4	5	6	7	8		
Flies	1	4	7	10	13	16	19	22		
Total Eaten	1	5	12	22	35	51	70	92		

Slow and steady!
Step by step
Iterative calculation

State the answers to the following: (1 mark each)

→ a) How many flies total will the frog have eaten when he has eaten the flies on the 8th lily pad? Answer: 92 It will have a total of 92 flies!

b. On which lily pad will it have eaten its 50th fly? Answer: 6th

It had eaten total 35 when done on 5th lily pad. So 36th to 51st fly on 6th pad

6. Problem Solve – Make a List. Karen has two quarters, two dimes and a nickel. List all the different sums of money she can make using only two coins.

$Q\ Q\ D\ D\ N$
 25 25 10 10 5

Here is the list \Rightarrow

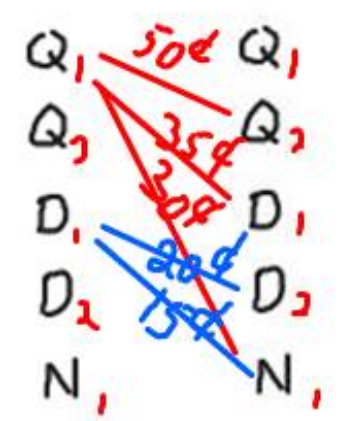
- QQ = 50¢
- QD = 35¢
- QN = 30¢
- DD = 20¢
- DN = 15¢

That is it for quarters

That is it! Already did every possible combination with Nickels

Probably the 5th time we have done this question!

	Q	Q	D	D	N	
QQ	✓	✓				50¢
QD	✓		✓			35¢
QN	✓				✓	30¢
DD			✓	✓		20¢
DN			✓		✓	15¢



Do question either 7 or 8.

If you do both then you can get extra bonus marks

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

- a. central angle beta (β) $\beta = 51.43^\circ$
b. vertex angle alpha (α) $\alpha = 128.57^\circ$

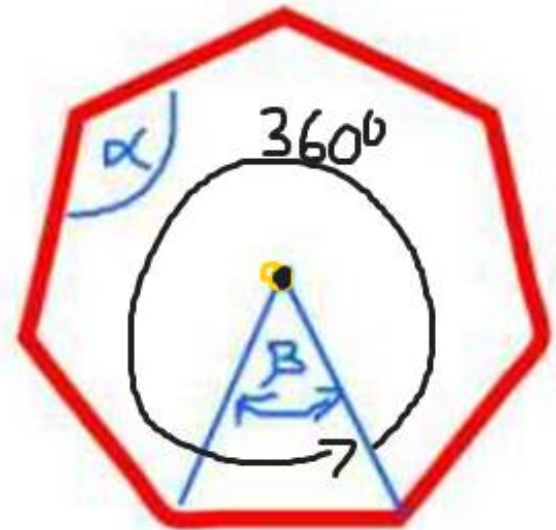
$$a) \quad 360^\circ/n = 360^\circ/7 = 51.43^\circ$$

$\beta = 51.43^\circ$

b) Determine α :

$$\begin{aligned} \text{Sum of all the vertex angles} &= (n-2) \cdot 180 \\ &= 5 \cdot 180 = 900^\circ \end{aligned}$$

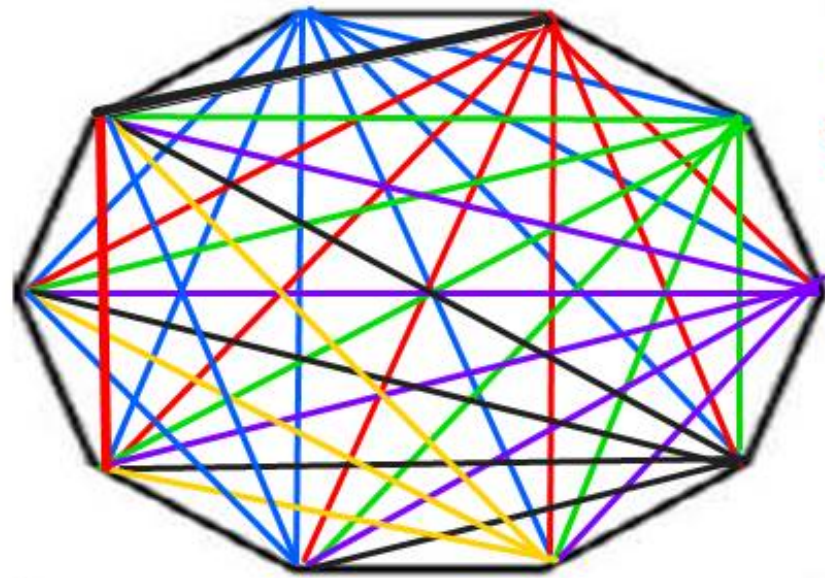
$$\therefore \text{Each individual vertex angle} \\ = 900^\circ/7 = 128.57^\circ$$



8. For this irregular 10-sided decagon determine:

a. the sum of all the interior vertex angles (1440°)

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



7
~~6~~
 6
 5
 4
 3
 2

a) sum of vertex angles = $(n-2) \cdot 180^\circ$
 = $(10-2) \cdot 180^\circ = (1440^\circ)$

+ 1

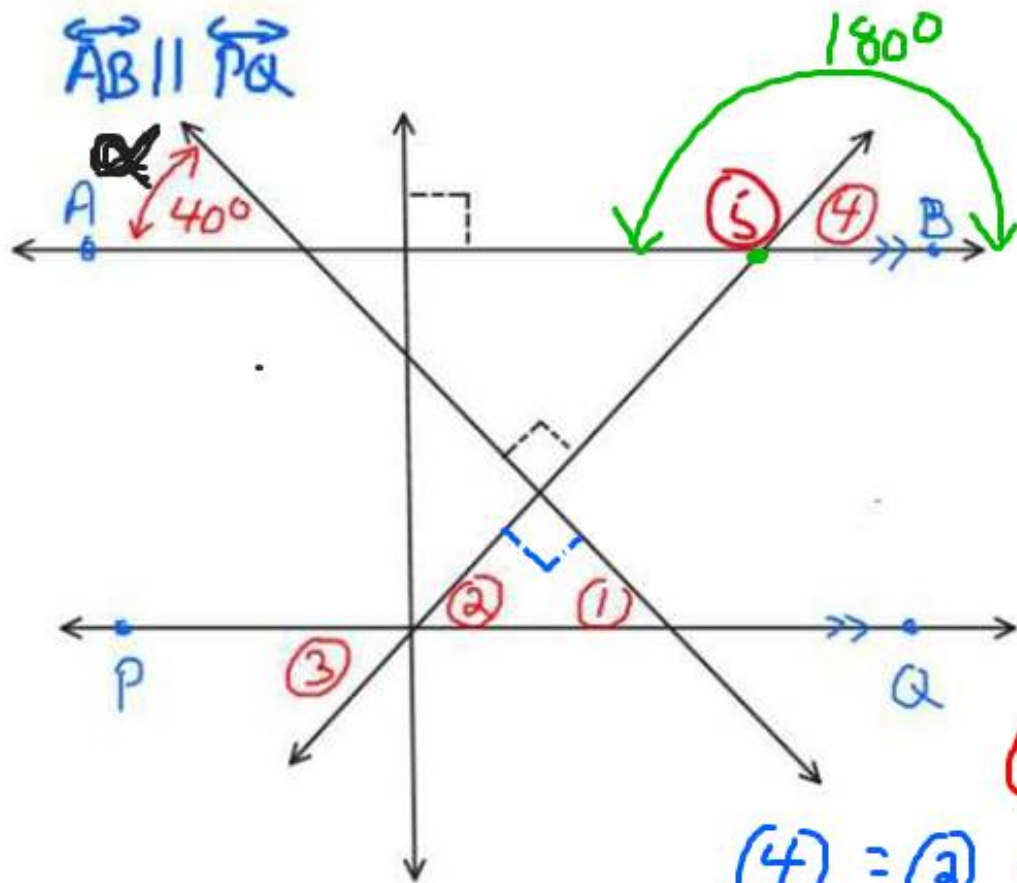
~~34~~
 35
 lol
 ...

b) nbr of diagonals = $\frac{n \cdot (n-3)}{2} = \frac{10 \cdot (10-3)}{2}$
 = $\frac{10 \cdot 7}{2} = 35 \text{ diagonals}$

BONUS QUESTIONS

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

BONUS: Euclidian Geometry (1 mark each)



Using Euclidian rules!

(1) = 40° since it corresponds with α

(2) is in a 90° right Δ
Triangle sum theorem
all angles add to 180°
 $\therefore (2) = 180 - (90 + (1))$
 $= 180 - 130 = 50^\circ$

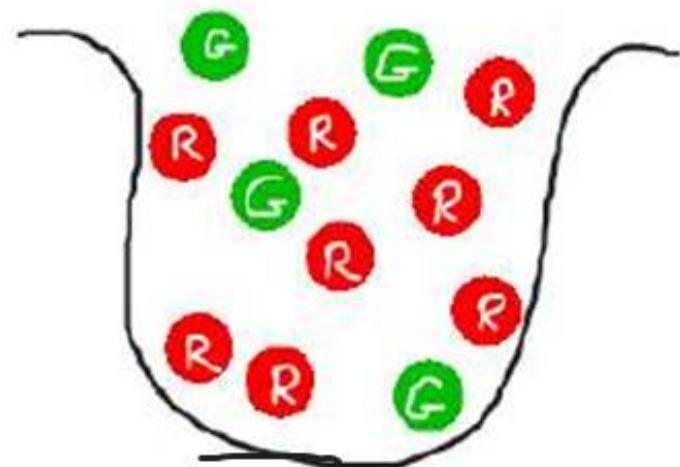
(3) = (2) since opposite angles

(4) = (2) since corresponds to (2) = 50°

(5) = supplement to (4) = $180 - (4)$
 $= 180 - 50^\circ$
 $= 130^\circ$

Bonus - Probability.

A bag contains 4 Green marbles and 8 Red marbles. Determine the probability of drawing a Red Marble. [$Prob(\text{Draw Red})$]. Express the answer as a reduced fraction and as a %.



$$P(\text{Green}) = \frac{\# \text{ of Green}}{\# \text{ Total}} = \frac{4}{12} = \boxed{\frac{1}{3}}$$

$$\frac{4}{12} \xrightarrow{\text{green arrow}} \frac{x}{100} \quad \begin{array}{l} \leftarrow \text{how much} \\ \leftarrow \text{per hundred} \end{array}$$

$\frac{4}{12}$ Calculator!
 $= \frac{1}{3}$

$$33.333333\bar{3} = \frac{4 \cdot 100}{12} = x$$

$$33.33 \approx x$$

$$\frac{4}{12} \approx \frac{33.33}{100} = \textcircled{33.33\%}$$

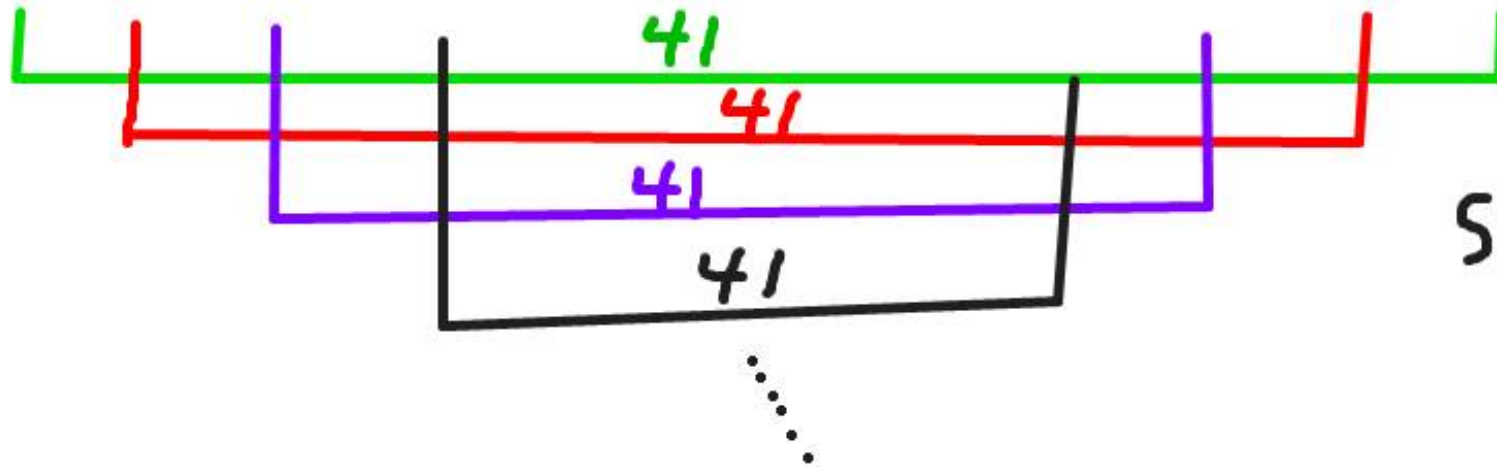
~~x~~ NOT 0.33%
~~x~~ NOT 33.33
 \checkmark 33.33% \checkmark

Bonus: (2 Marks)

Determine the sum of the counting numbers from 1 to 40

Have done this about 20 times by now since September! Look for a pattern

$$1 + 2 + 3 + 4 + \dots + 37 + 38 + 39 + 40 = ?$$



See a pattern??

How many paired up 41's will we have? 20

$$41 \cdot 20 = \boxed{820}$$

Bonus. Conversion (2 Marks)

Convert two weeks into seconds. $2 \text{ wk} = \underline{1,209,600} \text{ sec}$

Most logical way to do it!



$$2 \cancel{\text{wk}} \cdot \frac{7 \cancel{\text{days}}}{1 \cancel{\text{wk}}} \cdot \frac{24 \cancel{\text{hr}}}{1 \text{ days}} \cdot \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} \cdot \frac{60 \text{sec}}{1 \cancel{\text{min}}}$$

$$= 1,209,600$$

ONE MILLION, Two hundred Nine Thousand,
Six hundred seconds

Freddie!
Done this
a dozen
times!

Using a Formula. (2 Marks) The formula to convert degrees Celsius [$^{\circ}\text{C}$] to the American degrees Fahrenheit [$^{\circ}\text{F}$] is given by the formula:

$$^{\circ}\text{F} = \frac{9}{5} * ^{\circ}\text{C} + 32;$$

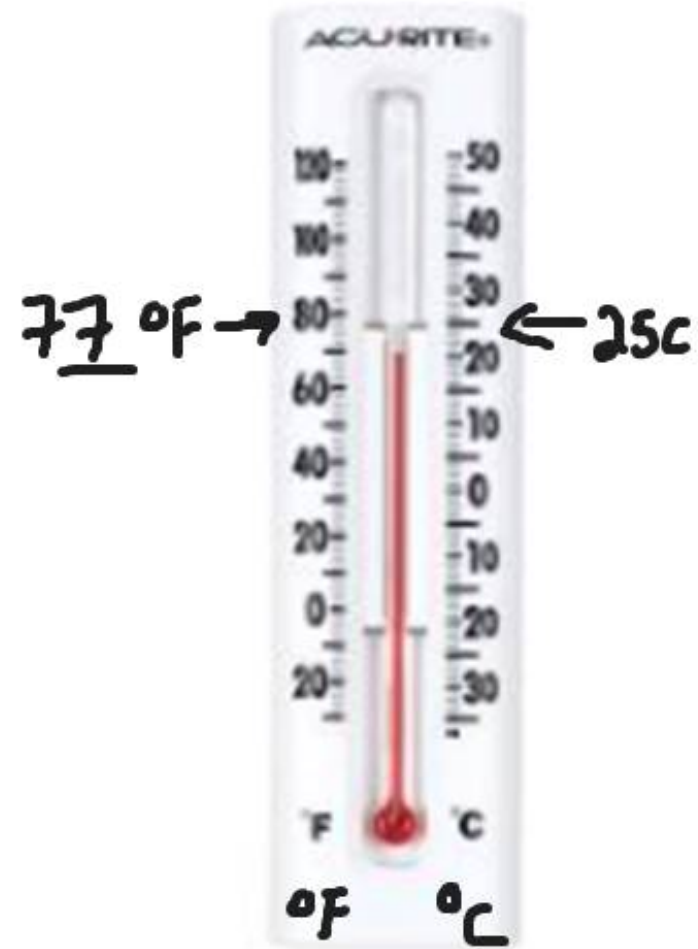
Convert 25 degrees Celsius (25°C) into degrees Fahrenheit $^{\circ}\text{F}$:

$$25^{\circ}\text{C} = \underline{\hspace{2cm}} ^{\circ}\text{F}$$

$$^{\circ}\text{F} = \frac{9}{5} * (25) + 32$$

$$^{\circ}\text{F} = 45 + 32 = 77$$

$$\boxed{25^{\circ}\text{C} = 77^{\circ}\text{F}}$$



Bonus - Using a Formula. The formula to count the total number of flies eaten in the question above is given by:

$S_n = \frac{n}{2} [2a_1 + (n - 1) * d]$, where S_n is the total sum of flies eaten, a_1 is the number of flies on the first lily pad, n is the number of the lily pad, and d is the amount by which each successive lily pad's fly count increases, $d = 3$ in this case.

This is Grade 11

Pre-Calculus stuff

In our case: $S_n = \frac{n}{2} * [2 * 1 + (n - 1) * 3]$,

evaluate that formula (plug-in) for $n = 15$ to calculate how many flies were eaten total, S_n , after the 15th lily pad.

After 15 Lilly pads the frog has eaten a total sum of 330 flies.

Just Plug into the formula!

If you wanna know how make the formula, ask!

$$\begin{aligned} S_{15} &= \frac{15}{2} \cdot [2 + (15-1) \cdot 3] = \frac{15}{2} \cdot [2 + 14 \cdot 3] \\ &= \frac{15}{2} \cdot (2 + 42) = \frac{15}{2} \cdot 44 = 15 \cdot 22 = \boxed{330} \end{aligned}$$