Grade 12 Essential

Quiz Debrief

Week 7

MrF

23-05-18

GRADE 12 ESSENTIAL
WEEKLY QUIZ WEEK 7

Name:_____
Date: _____

Closed book. *However*, use your and/or my Study Notes [Cheat Sheet].
You are expected to have your own Study Notes for the Final Exam

Each individual question is worth two marks

use separate Paper if necessary

Show work, show method. Do not use media, apps or google!

Diagrams are not necessarily drawn in exactly correct scale or proportion.

Round all decimal answers to nearest 0.01 as usual unless otherwise instructed

should NOT have to say this everytime!

Min
52.77777777777778

Q1
66.66666666666667

Median
94.44444444444444

Q3 100

Max 100

mean(a)

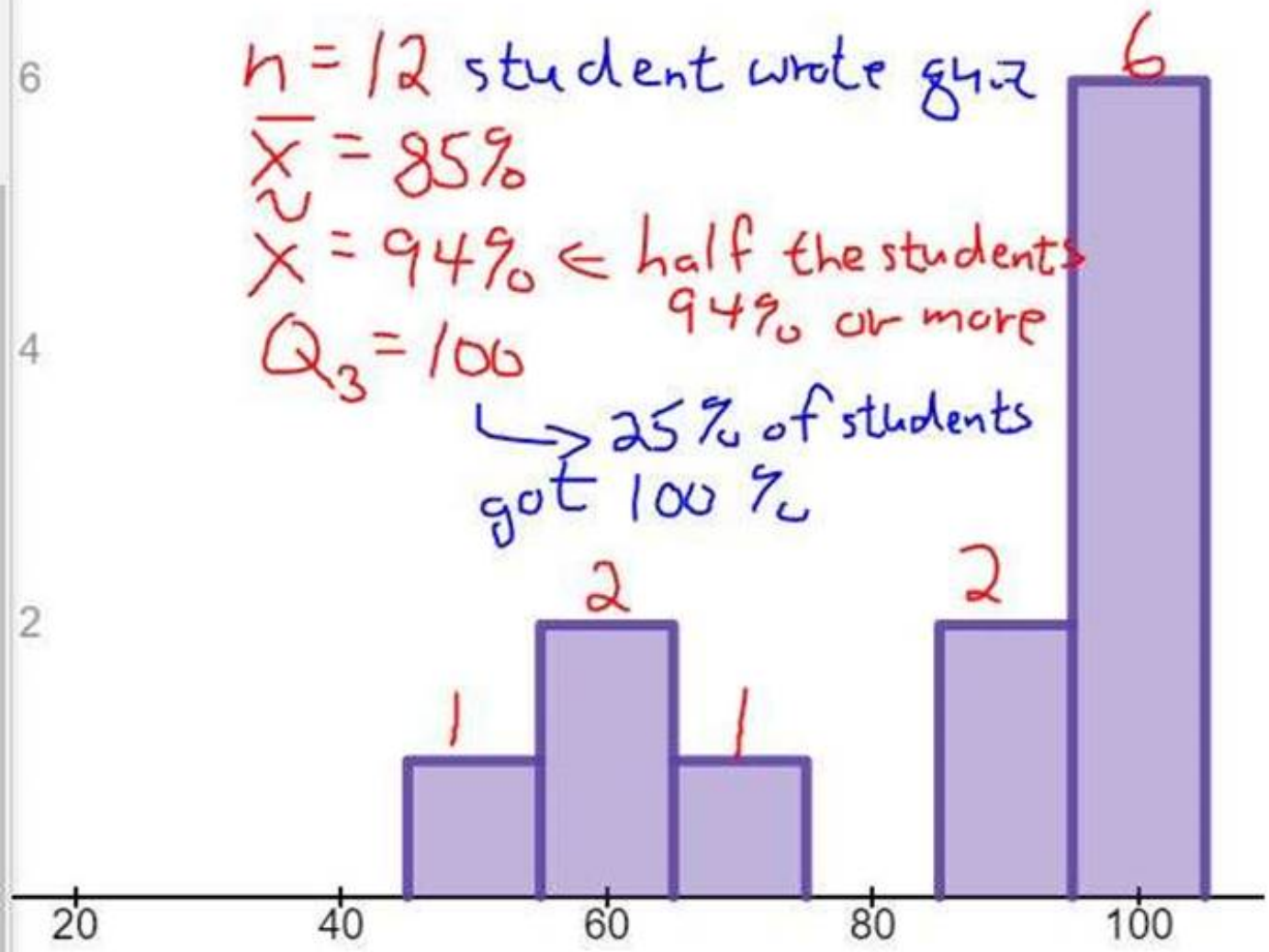
= 84.7222222222

histogram(a,10)

Data Set, Bin Width

BAR HEIGHTS

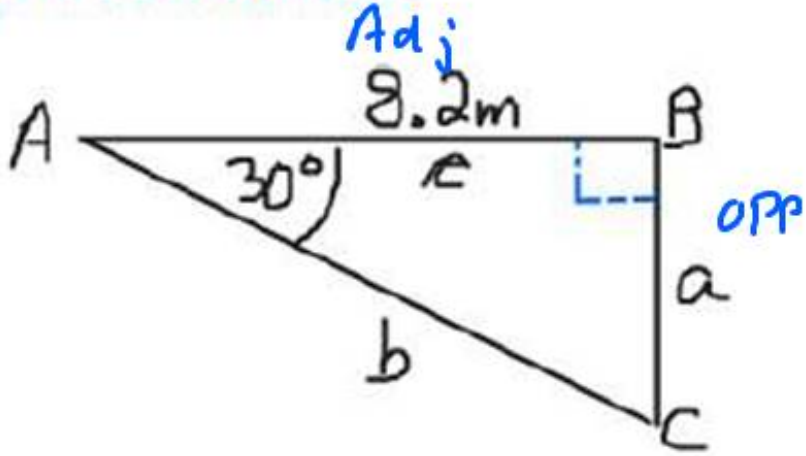
Count | Relative | Density



Seems to be strongly 'locking in marks' for some students and others not taking advantage?

Do Question 1 or 2 below but not both.
If you do both the better one will be marked

1. Determine length a and ∠C



Length a = 4.73 ; ∠C = 60°

Length "a" → simple SOH CAH TOA!

$\tan A = \frac{opp}{adj}$

$8.2 \cdot \tan(30°) = \frac{a}{8.2} \cdot 8.2$

$a = 8.2 \tan 30 = 4.73\ m$

TLAR!

We cudda used the sine law, more messy

$\angle C = 180 - 120 = 60°$

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

$a = \frac{c \cdot \sin(A)}{\sin(C)} = \frac{8.2 \cdot \sin(30)}{\sin(90)}$

$a \approx 4.73$

Find m∠C

use triangle sum theorem!

$\angle A + \angle B + \angle C = 180°$

$30 + 90 + \angle C = 180$

$120 + \angle C = 180°$

$\angle C = 60°$

or we cudda calculated

$b^2 = 8.2^2 + 4.73^2 = 89.6129 \therefore b \approx 9.47$

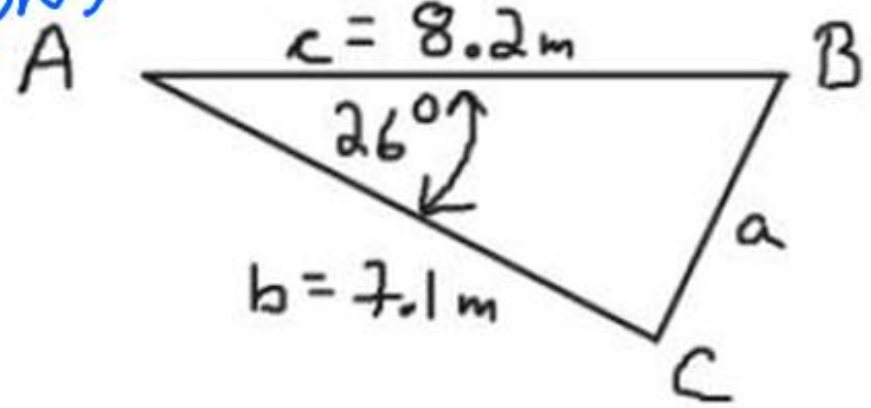
and then $\angle C = \cos^{-1}\left(\frac{4.73^2 + 9.47^2 - 8.2^2}{2 \cdot 4.73 \cdot 9.47}\right)$

$\angle C \approx 59.98°$

That would be fun too!!

2. Determine length a and ∠C

(OPTION)



Length a = 3.60 m

∠C = 85.70° to 94°

"included" side ↘ ↙ angle ↙ side

SAS

Length a: cos law!

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

Write down the formula

$a^2 = 7.1^2 + 8.2^2 - 2 \cdot (7.1) \cdot 8.2 \cdot \cos 26^\circ$ ←

Now plug in the numbers

Some students are still just flinging numbers all over !!

$7.1^2 + 8.2^2 - 2 \cdot 7.1 \cdot 8.2 \cdot$

$a^2 =$ = 12.994421248

$a = \sqrt{12.9944212489}$ = 3.6047775588

≈ 3.60

Some students are STILL forgetting to 'un-square' with the square root'. How could a possible be 12.99 long, would make no sense

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Now find ∠C

sine law: $\frac{\sin C}{c} = \frac{\sin A}{a}$;

depending!

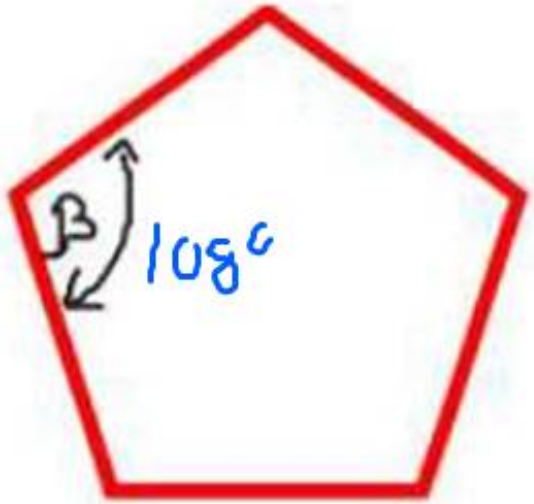
85°-95°

$\sin C = \frac{8.2 \cdot \sin 26^\circ}{3.60477} = 0.9971\ldots$

$C = \sin^{-1}(0.9972) = 85.70^\circ$ to 94°

This is a case where any rounding can make a big difference in the final answer

3. Given the **regular** pentagon at right determine:



a. the sum of all the interior angles. 540°

b. the measure of the vertex angle(s) β. 108°

a) Sum of interior angles of polygon

$= (n-2)\cdot 180^\circ = (5-2)\cdot 180 = 3\cdot 180$

$= 540^\circ$

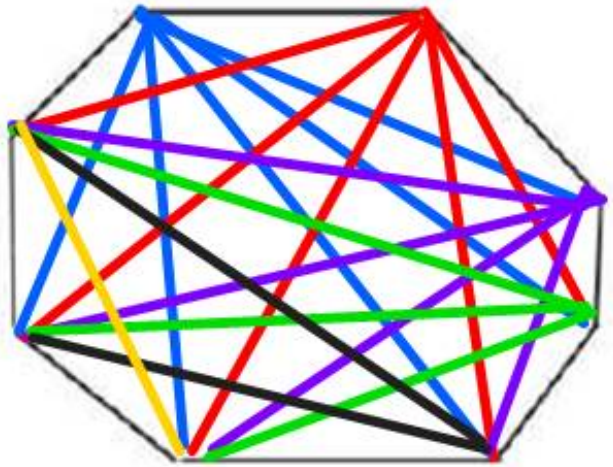
write down formula — plug in numbers (evaluate)

b) 540° total shared equal by 5 vertices

$\beta = 540^\circ / 5 = 108^\circ$

Do Question 4 or 5 below but not both.
If you do both the better one will be marked

4. For the irregular octagon at right determine the number of diagonals that would cut across it from vertex to vertex.



Formula!

$$\text{diagonals} = \frac{n \cdot (n-3)}{2}$$

$$= \frac{8 \cdot (8-3)}{2}$$

$$= \frac{8 \cdot 5}{2} = 20 \text{ diagonals}$$

that cut across corner to corner

5
5
4
3
2
+ 1
20

OMG

5. A 7-sided heptagon is inserted in a Star Blanket. Determine the measure of the central angle α. [Angle 'alpha']

360^0 angle around the centre.

Equally shared with 7 sectors

$360^0/7 \cong \boxed{51.43^0}$ TLAR

Show work always!

Do Question 6 or 7 below but not both.
If you do both the better one will be marked

OMG!

6. **Word Problem**. A farmer has 65 animals; pigs and chickens. She forgets how many she has of each animal but she does remember they have a total of 206 legs. Determine how many chickens the farmer has.

# of chicks x — # of pigs y — animals $x+y=65$ — ↳ x

Chicken Legs ($x \cdot 2$) — Pig Legs ($y \cdot 4$) — Total legs

$20 + 45 = 65$ ✗ — $20 \cdot 2$ 40 — $45 \cdot 4$ 180 — 220

Need fewer legs! less pigs, more chickens

Close! $30? + 35 = 65$ — $30 \cdot 2 = 60$ — $35 \cdot 4 = 140$ — close! 200 legs

↙ more pigs, less chicks

$27 + 38 = 65$ — $27 \cdot 2 = 54$ Chick legs — $38 \cdot 4 = 152$ pig legs — $54 + 152 = 206$ ✓ legs

The framer has 27 chickens

Some wild ways that students do this. Have done this maybe 15 times since September

7. **Word Problem**. Three hot dogs plus one coke cost you $9.25. Your friend buys three hot dogs and two cokes and spends $10.25. Determine the price of a hot dog.

OMG, have done this a dozen times too!
Guess and Check??
Logic?
Draw it?

Logic! ONE extra coke cost an extra $1.00

So if 3 hd + $1 coke is 9.25, then the 3hd must be $8.25 TRUE!

If 3hd cost 8.25 then 1 hd = 8.25/3 = $2.75

Check: $3 \cdot (2.75) + 1 = 9.25$ ✓

$3 \cdot (2.75) + 2 \cdot 1 = 10.25$ ✓

Logic

7. **Word Problem**. Three hot dogs plus one coke cost you $9.25. Your friend buys three hot dogs and two cokes and spends $10.25. Determine the price of a hot dog.

Let ⬭ be a hotdog price of
Let ⊔ be price of coke

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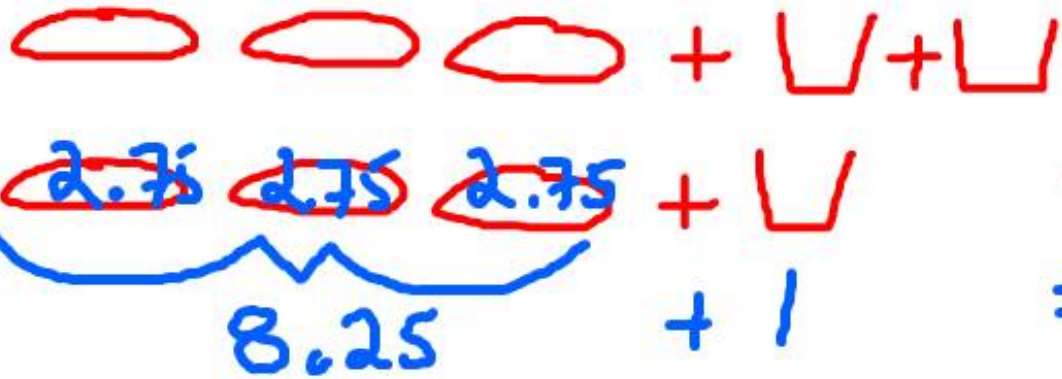
Guess and Check??
Logic?
Draw it?



⬭⬭⬭ + ⊔ + ⊔ = 10.25

~~2.75~~ ~~2.75~~ ~~2.75~~ + ⊔ = 9.25

8.25 + 1 = 9.25

⊔ = 10.25
− (9.25)
1.00

There are more reliable and expeditios ways to solve this type of problem of course. Go to end of the movie if you care.

MULTIPLE CHOICE

Circle the letter of the best or closest answer

8. An isosceles triangle has:

   a. no sides the same length
   b. all three sides the same length
   c. all three angles congruent
   d. at least two sides the same length

"scalene"

"equilateral"

Are you reading all the glossary items I do for you? Are you reading the word of the day?

9. A twenty-sided polygon [an 'Icosagon'] would have this many diagonals cutting across it:

a. 21 b. 170 c. 20^2 d. $20 * 19 = 380$

$$\#\text{of diagonals} = \frac{n \cdot (n-3)}{2}$$

$$= \frac{20 \cdot (20-3)}{2} = \frac{20 \cdot 17}{2}$$

$$= 10 \cdot 17 = 170 \text{ diagonals}$$

each corner can shoot out a line to (n-3) other corners. There would be n*(n-3) lines. But half of them would be duplicates! So divide by two!

10. The monthly loan payment for a loan of $8,600 for 5 years at 10% interest would be: [rounded to nearest $10] [Use loan tables or an App or website if you know how]

a. $180 b. $460 c. $4,300 d. $430

21.25 · 8,600/1,000 = $182.75

Loan amount

$8,600

Enter the total amount you want to borrow.

Bank website

Payment frequency

Monthly

How often would you like to make payments?

Interest rate

Enter an interest rate.

ortization

ears

ect the number of years you'll need to pay back your loan.

Your estimated monthly loan payment

$183

Monthly Vehicle Loan Payments per Thousand Borrowed

Interest Rate	Years to Repay Loan						
	1	2	3	4	5	6	7
4.00%	$85.15	$43.42	$29.52	$22.58	$18.42	$15.65	$13.67
4.25%	$85.26	$43.54	$29.64	$22.69	$18.53	$15.76	$13.78
7.50%	$86.76	$45.00	$31.11	$24.18	$20.04	$17.29	$15.34
8.00%	$86.99	$45.23	$31.34	$24.41	$20.28	$17.53	$15.59
10.00%	$87.92	$46.14	$32.27	$25.36	$21.25	$18.53	$16.60
15.00%	$90.26	$48.49	$34.67	$27.83	$23.79	$21.15	$19.30
20.00%	$92.63	$50.90	$37.16	$30.43	$26.49	$23.95	$22.21
25.00%	$95.04	$53.37	$39.76	$33.16	$29.35	$26.94	$25.31

BONUS QUESTIONS (2 marks each)

A. Determine the sum of the counting numbers from 1 to 25

Done this a dozen times before too!
Several ways to solve it

$1+2+3+\cdots+23+24+25=$

How many 26's?

12 pairs + middle # left over

$26 \cdot 12 = 312$

$+\ 13$

325

or

$25 \cdot 12 = 300$ for 1 to 24

$+\ 25$ at end

325

Several other ways! Ask!

which number was not paired up? 13 $\frac{25+1}{2}=13$

B. There is about three weeks till the final exam. Determine how many seconds in three weeks.

OMG!

USE THE UNITS FORCE Luc!

Preffered method: Conversion Factors

3 weeks = ? seconds

$$3\,\text{wk} \cdot \frac{7\,\text{day}}{1\,\text{wk}} \cdot \frac{24\,\text{hr}}{1\,\text{day}} \cdot \frac{60\,\text{min}}{1\,\text{hr}} \cdot \frac{60\,\text{sec}}{1\,\text{min}}$$

$$= 1,814,400 \text{ seconds}$$

and counting!!

C. Determine the mean, median, mode, and range of the data set:
{ 2, 4, 7, 7, 2, 5, 8, 7, 9,15 }

$$\bar{x} = \frac{\Sigma x}{n} = \frac{66}{10} = 6.6$$

$$\tilde{x} = 7$$

$x_{mode} = 7$

{ 2, 2, 4, 5, 7, 7, 7, 8, 9, 15 }

$\tilde{x} = 7$

Range: (15-2) = (13)

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Logic?
Draw it?

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OMG!

6. **Word Problem**. A farmer has 65 animals; pigs and chickens. She forgets how many she has of each animal but she does remember they have a total of 206 legs. Determine how many chickens the farmer has.

Guess and Check for most Essential Students?

There are more reliable and expeditious ways to solve this type of problem of course. Go to end of the movie if you care.

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