Grade 11 Essentials Math Week 4 Quiz
DEBRIEF

22-12-01

MrF

GRADE 11 ESSENTIAL
QUIZ WEEK 4

Due Monday 13:00

Instructions: These are the general instructions you will have for all quizzes, tests, and the final exam.

- You are always allowed a single page double-sided 8.5" X 11" *'cheat sheet'* for all quizzes, tests, & the final exam
- **Round** decimal answers to nearest 0.01 or as indicated

  → *"standard"!*

- Show **Units**
- **Show work** for best mark. No marks for just an answer!

  It ensures you are following correct steps

  It enables teacher to give part marks knowing you understand the idea

  It enables you to go back and readily check calculations

- Each individual question is worth two marks
- This is a **collaborative** quiz, open book, take-home, feel free to collaborate with other classmates.

  5 days, including weekend plus class time!

1. Calculate the length of side **c**.
[Grade 10]

"Pythagoras" two shorter

hypotenuse ↘   ↙ ↙ legs

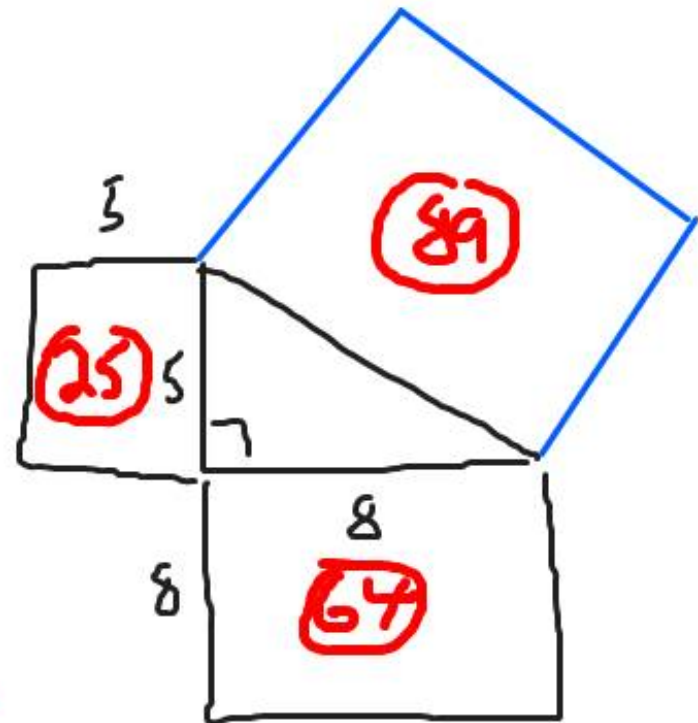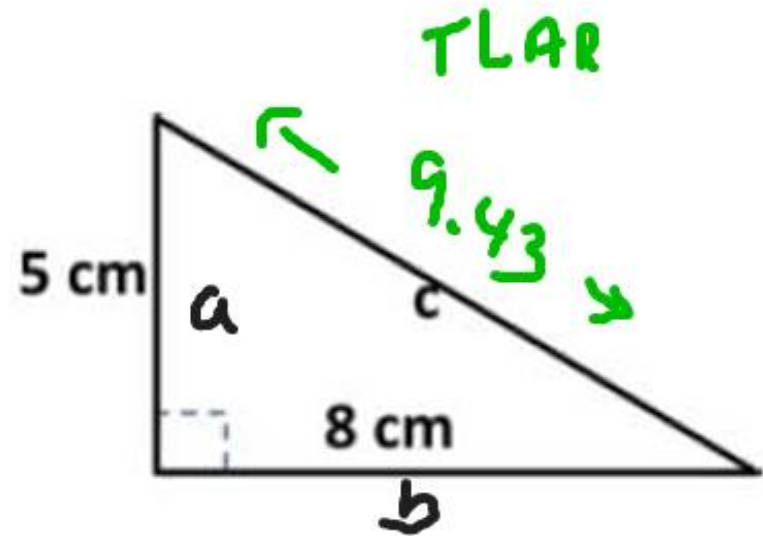$$c^2 = a^2 + b^2$$

$$c^2 = 5^2 + 8^2 = 25 + 64$$

$$c^2 = 89$$

$$c = \sqrt{89} \cong 9.43 \text{ cm}$$

TLAR

↖ 9.43 ↘

5 cm   a   c

8 cm
b

what times
itself = 89 ?
~ 9.5 maybe!

round to nearest
0.01

This is what
you are ⟹
thinking

25
+64
___
89

5   (89)

(25) 5

8
8   (64)

- Label Triangle
- Write down formula
- Plug in numbers
- Simplify numbers
- Solve
- Check

2. Determine the **Surface Area** and the **Volume** of the triangular prism.

SA : $\underline{1,851}$ cm^2

VOL : $\underline{\qquad}$

$\leftarrow$ —h prism —$\rightarrow$

h$_\triangle$ 16 cm

16 cm

b$_\triangle$

23 cm

Front Face

29 cm

Surface Area:

16   29 Back 16

16

16

Front 23

16

16

Bottom 16
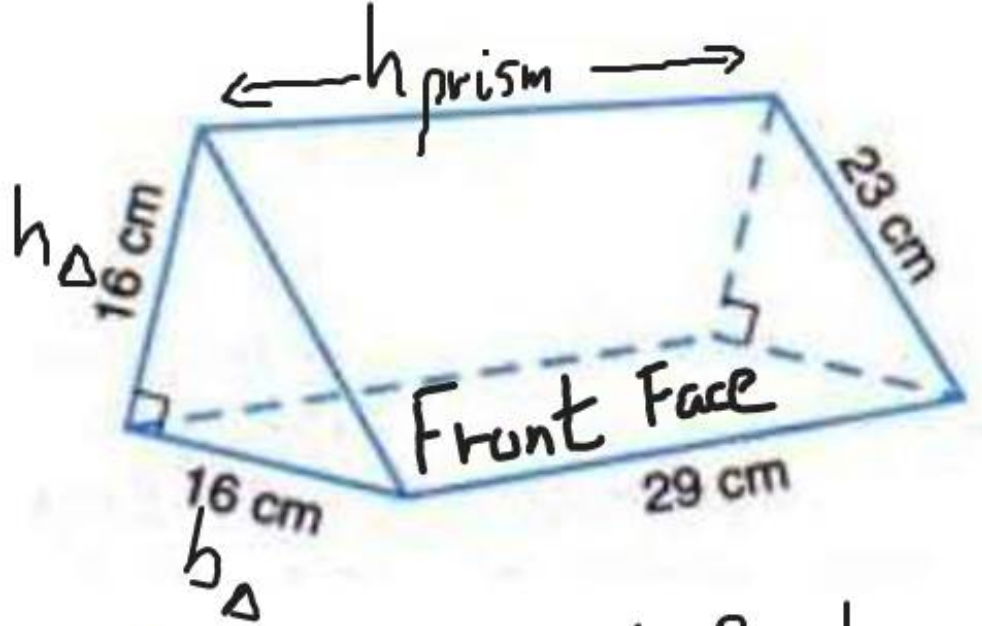
Front $29cm \cdot 23cm = 667\,cm^2$

Back $29 \cdot 16 = 464\,cm^2$

Bottom $29 \cdot 16 = 464\,cm^2$

Two Triangles $2 \cdot (\frac{1}{2} \cdot b_\triangle \cdot h_\triangle) =$

$2 \cdot (\frac{1}{2} \cdot 16cm \cdot 16cm)$ $256\,cm^2$

There is a funky formula that works a bit quicker

$\boxed{1,851\;cm^2}$

Volume: $V = B \cdot h_{prism}$

$V = (\frac{1}{2} \cdot b_\triangle \cdot h_\triangle) \cdot h_{prism}$

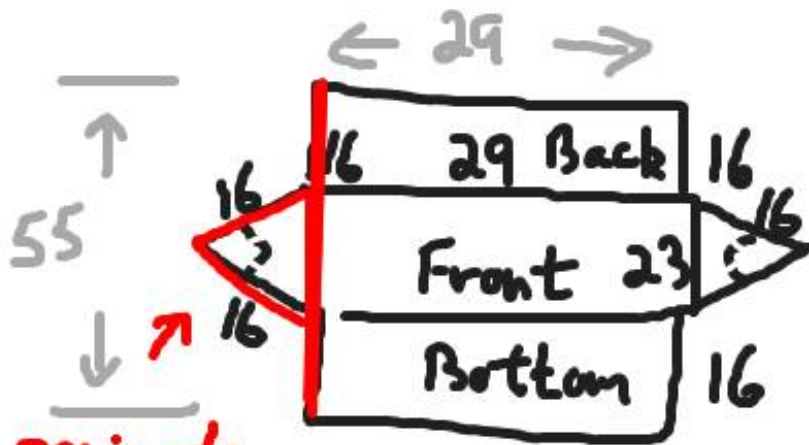$V = (\frac{1}{2} \cdot 16cm \cdot 16cm) \cdot 29\,cm$

$V = 128\,cm^2 \cdot 29\,cm$

$V = 3,712\,cm^3$

2. Determine the **Surface Area** and the **Volume** of the triangular prism.

SA : _____

VOL : _____

16 cm

23 cm

Front Face

16 cm

29 cm

Surface Area:

← 29 →

55

16
16
16

16   29 Back 16

Front 23

Bottom 16

16
16
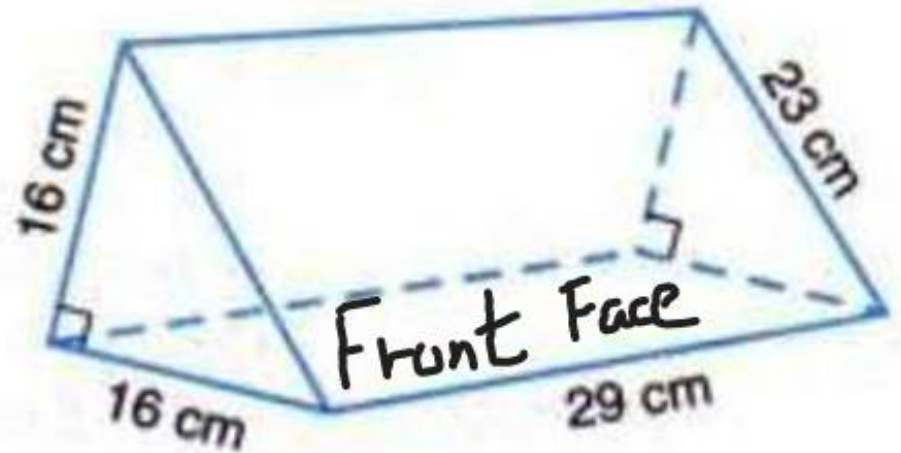
perimeter
of base shape
= 16+16+23 = 55‾

Here is that fancy formula
I do not recommend!

$$SA = P_B + b_\triangle h_\triangle \quad \leftarrow \; b_\triangle \cdot h_\triangle$$

$$55 \cdot 29 + 16^2$$

$$= 1,851 \, cm^2$$

The fancy formula! Just add up the faces, it is more reliable

3. Karen borrows $3,500 for 5 years. Her annual interest rate is 8.5% APR [Annual Percentage Rate].

   a. what amount would she pay back at the very end of the term of the loan if it was **simple interest**? $4987.50

   b. what amount would she pay back at the very end of the term of the loan if it was **compound interest** *compounded monthly*? $5,345.55

   c. what amount would she have paid back total if she had paid it back with regular **monthly payments** (use your coloured loan tables)

   a) $I = Prt = 3500 \cdot 8.5\%_{100} \cdot 5 = \$1,487.50$ Interest
   $$+ \ 3,500.^{00} \ \text{Principal}$$
   $$\overline{\$4,987.50 \ \text{Amount}}$$
   OWED

   b) $A = P \cdot (1 + \frac{r}{s})^{(n \cdot s)} = 3,500 \cdot (1 + \frac{0.085}{12})^{(5 \cdot 12)}$
   $$= \$5,345.55$$

3. Karen borrows $3,500 for 5 years. Her annual interest rate is 8.5% APR [Annual Percentage Rate].

a.   what amount would she pay back at the very end of the term of the loan if it was **simple interest**? $4,987.50 ←

b.   what amount would she pay back at the very end of the term of the loan if it was **compound interest** *compounded monthly*?
$5,345.55 ←

c.   what amount would she have paid back total if she had paid it back with regular **monthly payments** (use your coloured loan tables)

$20.52/1,000 • 3,500 = $71.82/month payment monthly ✓

71.82/month • 60 months = $4,309.20

total Amount paid.

MONTHLY LOAN PAYMENT TABLE *FOR A LOAN OF $1,000*

Annual Rate	1 Year Monthly	2 Years Monthly	3 Years Monthly	4 Years Monthly	5 Years Monthly
2%	$84.24	$42.54	$28.64	$21.70	$17.53
3%	$84.69	$42.98	$29.08	$22.13	$17.97
4%	$85.15	$43.42	$29.52	$22.58	$18.42
5%	$85.61	$43.87	$29.97	$23.03	$18.87
6%	$86.07	$44.32	$30.42	$23.49	$19.33
7%	$86.53	$44.77	$30.88	$23.95	$19.80
8%	$86.99	$45.23	$31.34	$24.41	$20.28
9%	$87.45	$45.68	$31.80	$24.89	$20.76
10%	$87.92	$46.14	$32.27	$25.36	$21.25

8% → 20.28
8.5% → 20.52   (20.28 + 20.76)/2
9% → 20.76

4. Determine the total Surface Area and the Volume of this right cylinder.
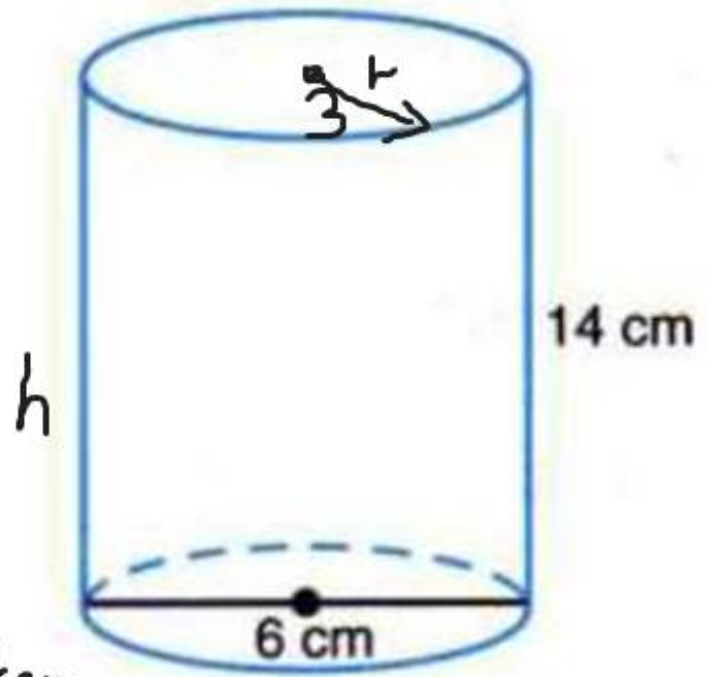
SA : **320.44** square centimetres

VOL : _____

Surface Area $= 2\pi r^2 + 2\pi r h$

$= 2 \cdot \pi \cdot (3cm)^2 + 2 \cdot \pi \cdot 3cm \cdot 14cm$

$= 263.89 \ cm^2 + 56.55 \ cm^2$

$= 320.44 \ cm^2$

14 cm

h

6 cm

$V = \pi r^2 \cdot h$

$V = \pi \cdot (3cm)^2 \cdot 14cm^1$

$V = 395.84 \ cm^3$

cubic cm

aka ml

5. If Mike borrows $400 from a payday loan company for 2 months on a **simple interest loan**, and pays back $440. What annual percentage rate (APR) did he pay?

$$I = Prt$$

$$\$40 = \$400 \cdot r \cdot \frac{2}{12}$$

tidy up

$$40 = 66.66666\ldots \cdot r$$

$$60\% \quad 0.6 = \frac{40}{66.6666\ldots} = r$$

Interest rate = 60%

6. If five pizzas and two cokes cost a total of $76.50 but each coke cost $2. How much does one pizza cost?

6. If five pizzas and two cokes cost a total of $76.50 but each coke cost $2. How much does one pizza cost? — — — — — Guess & check?

$ONE PIZZA	Five Pizza	+ $4 of Coke	Total	
x $10 ?	$50	+ 4	$54	WRONG
$15 ?	$75	+ $4	$79	WRONG! Close! Too High
✓ $14.50	$72.50	+ $4	$76.50 ✓	

ONE PIZZA COSTS $14.50 ✓

Check!! $5 \cdot (14.50) + 4 \overset{?}{=} 76.50 \overset{?}{.}$

$76.50 = 76.50$ ✓

Yes! 14.50 works

6. If five pizzas and two cokes cost a total of $76.50 but each coke cost $2. How much does one pizza cost?

Guess & check?

Guess

$$5 \cdot 10 + 4 = 54$$

$$5 \cdot 15 + 4 = 79$$

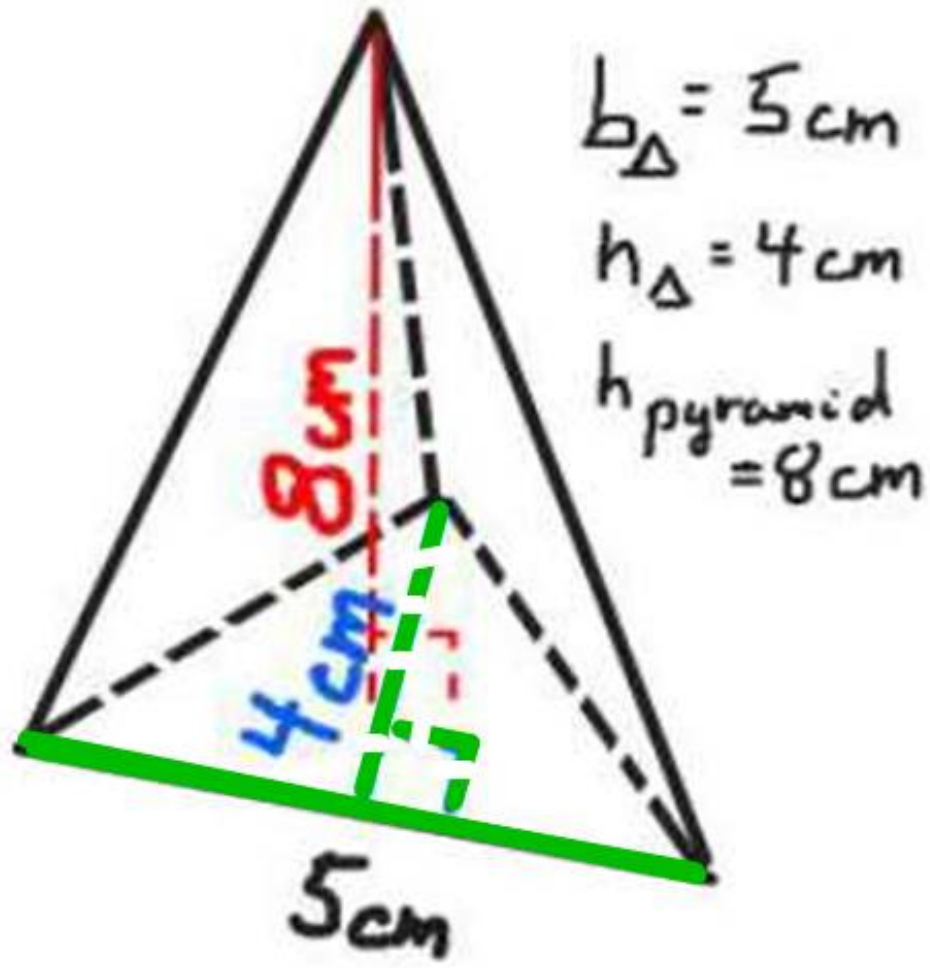$$5 \cdot 14.5 + 4 = 76.5$$

A good calculator makes

guess and check so much quicker

main   abc   func   DEG   clear

q w e r t y u i o p

a s d f g h j k l

= z x c v b n m , ⌫

Having multi-line display is useful !

This is the DESMOS calculator you have been encouraged to try

7. Determine the Volume of the Triangular Pyramid

$b_\triangle = 5\,cm$

$h_\triangle = 4\,cm$

$h_{pyramid} = 8\,cm$

$$V_{pyr} = \tfrac{1}{3} \cdot \underset{area}{Base} \cdot h_{pyr}$$

> **Same formula as prism but multiply by 1/3**

$$V = \tfrac{1}{3} \cdot (\tfrac{1}{2} \cdot 5 \cdot 4) \cdot 8$$

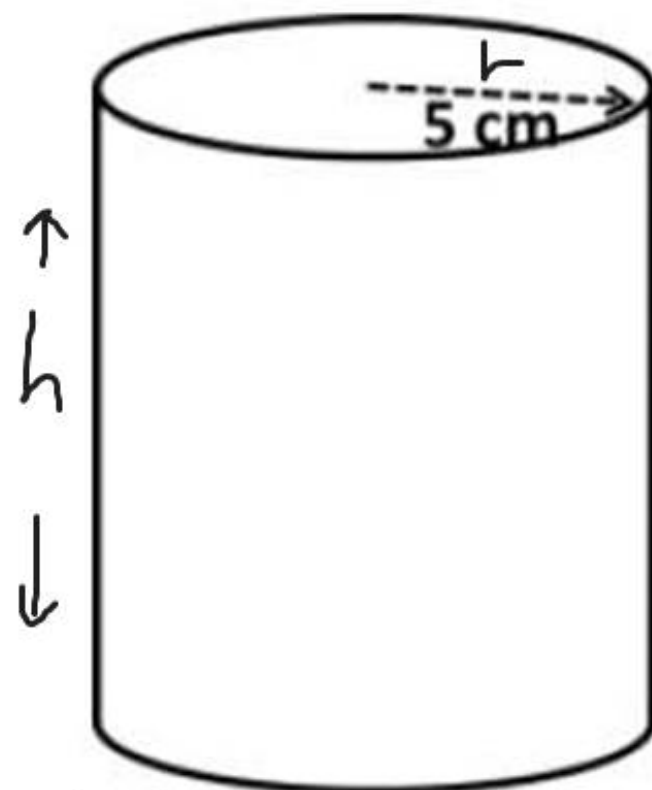Area of base shape triangle

$$V = \tfrac{1}{3} \cdot (10) \cdot 8$$

$$V = \tfrac{80}{3} = 26.67\,cm^3$$

BONUSES (2 mark each)

1. The volume of this cylinder is one litre (ie: 1,000 cm³)

Calculate the height, *h*, of the cylinder.

5 cm

h

$$V_{cyl} = \pi r^2 \cdot h$$

$$1000 = \pi \cdot 5^2 \cdot h$$

$$1,000 = 78.5398... \cdot h$$

$$\frac{1,000}{78.5398} = \frac{78.5398... \cdot h}{78.5398...}$$

h = 12.73 cm high ✓

plug in the #s!

tidy up the #s

Check!!   Yes

$$1,000 \overset{?}{=} \pi \cdot 5^2 \cdot 12.73 \; ?$$

$$1,000 = \boxed{\pi*5^2*12.73}$$
$$\qquad\quad 999.81186$$

2. Determine the sum (ie: add them all up) of the whole counting numbers from 1 to 49.

(25)

$1 + 2 + 3 + 4 \; + \; + \; 1 + \; + \quad 45 + 46 + 47 + 48 + 49$

50
50
50
50
50
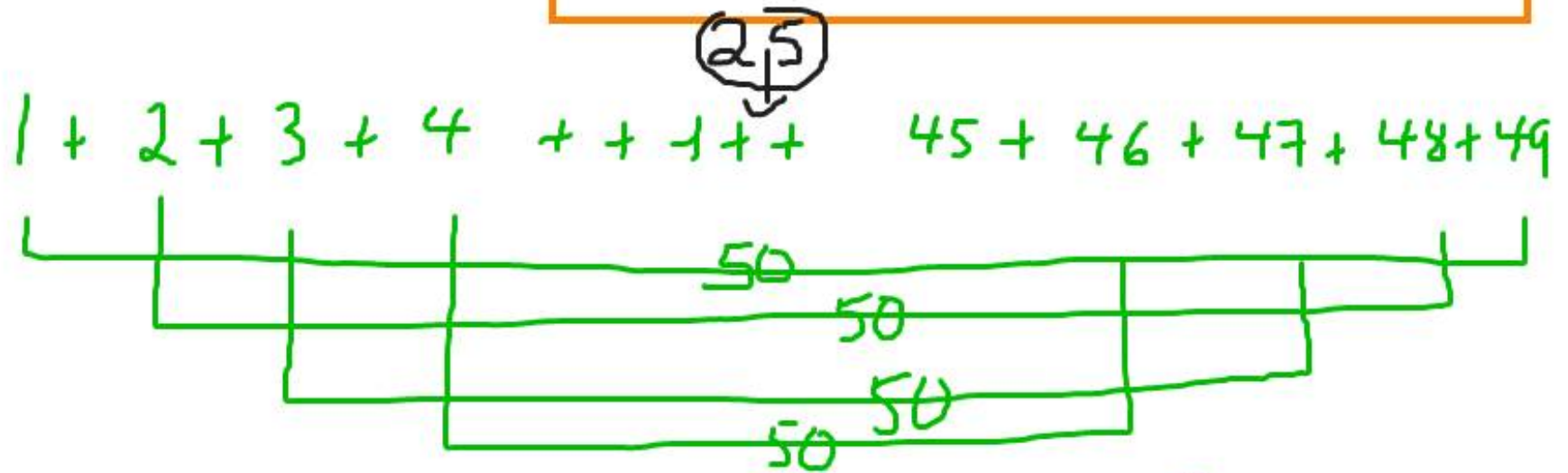
Pair the ends up! How many 50's? 24!

$50 \cdot 24 = 1200$

but there is one number in the middle we left out since we had an odd number of numbers

So we did 24 from each end so 25 was left out

$$\begin{array}{r} 1200 \\ + \; 25 \\ \hline (1225) \end{array}$$

2. Determine the sum (ie: add them all up) of the whole counting numbers from 1 to 49.

Or maybe you can find the sum of the numbers from 1 to 50 which is obviously

$$51 \cdot 25 = 1275$$

and then subtract the 50 that isn`t really there!

$$\begin{array}{r} 1275 \\ - 50 \\ \hline 1225 \end{array}$$

or i see several folks found a formula on the intenet!

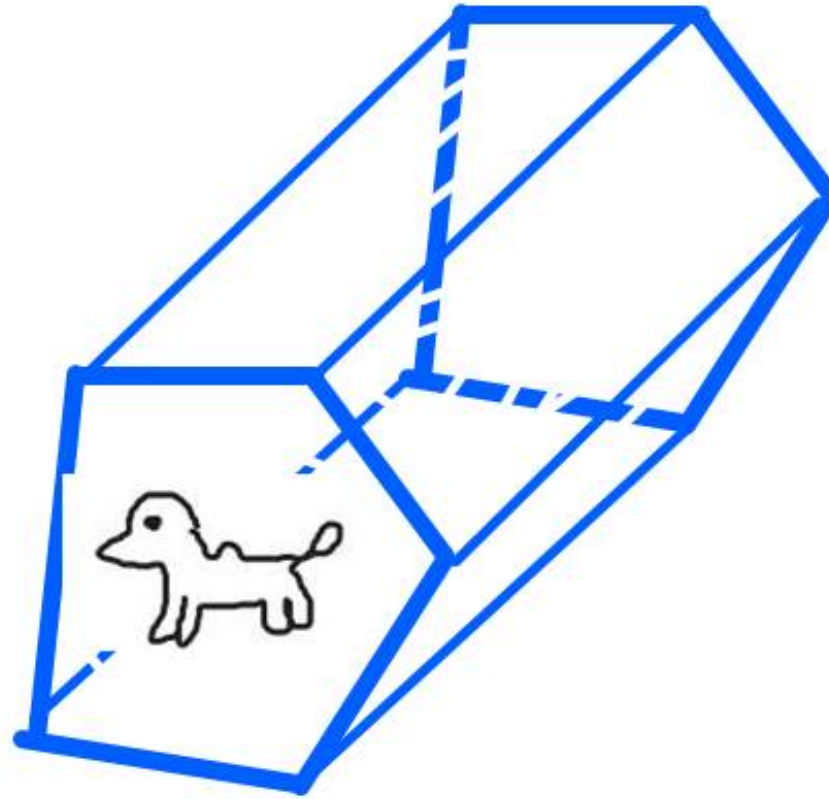$$Sum = \frac{n \cdot (n+1)}{2} = \frac{49 \cdot (49+1)}{2} = 1225$$

or you can use beads, or a few other methods

3. Mike Miser is saving up for a new game. He saves $2 the first week. Each week after that he saves twice as much as he saved the week before. If this pattern continues, how much will he have saved in 6 weeks?

Do a table

week →	1	2	3	4	5	6
Saved this week →	2	4	8	16	32	64
Total Saved →	2	6	14	30	62	(126)

4. Draw me a picture of a cute puppy inside a pentagonal prism

Determined to Deliver Baby!