Grade 12 Applied

Quiz Debrief Week 1

26 Jan 2023

Most of this should be familiar!

Grade 12 Applied Week 1 Quiz

A quick weekly quiz. Time limited! Open book (obviously). Use my cheat sheet(s) or any notes. Issued *'cheat sheets'* from the other grades are mighty useful!

The quiz will be made available for 90 mins at or before start of class. Submissions will be shut down after 90 minutes.

Have scrap paper and calculator ready.

Round all decimal amounts to nearest 0.01. **Simplify** (reduce) all fractions as usual.

Read instructions!

Use the notation **cm^2,** for example, to represent **square units** of measure since superscript exponents are not practicable in the webpage.

There are several **Bonus** questions if you need the marks. Do them regardless.

Cher has a bag of marbles as pictured below. Determine the theoretical * 2 points
probability that she draws out a **Green** marble. Select best answer.
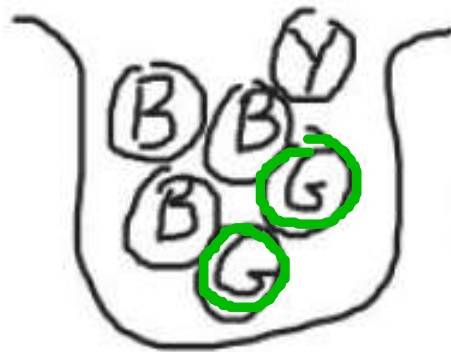
B = Blue
G = Green
Y = Yellow

$$Probability = \frac{\# Favoured\ outcomes}{\# all\ possible\ outcomes}$$

$$P(Green) = \frac{2\ green}{6\ total} = \frac{2}{6} = \frac{1}{3}$$ Reduce all fractions

- ~~4:2~~ odds
- 1/2
- 50%
- 1/3
- 2/6

Given the fair spinner below, determine the **probability** that an **outcome** of
"**4**" will be spun on any spin.
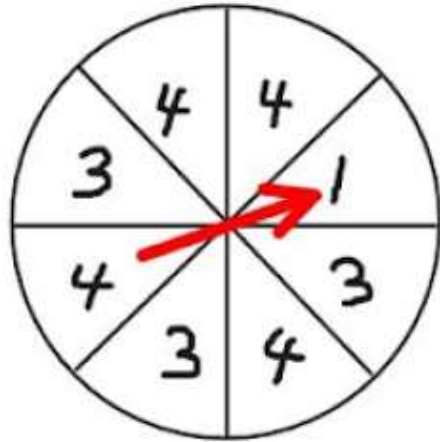
"Fair spinner;
each outcome
equally likely!"

↙ Four "4"s

Really? 400%?

Really?
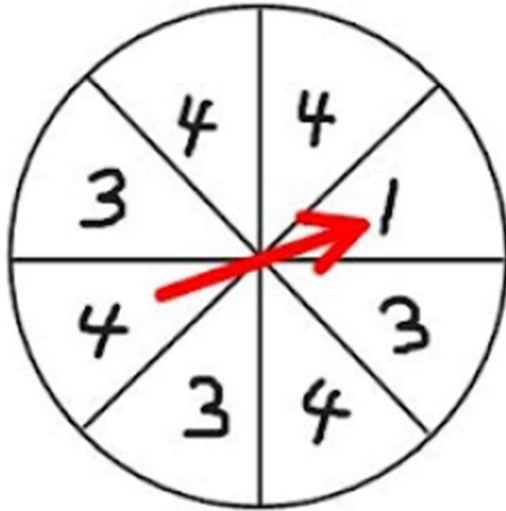
Probability $= \dfrac{\#\text{Favoured outcomes}}{\#\text{all possible outcomes}}$ ↞ 8 possible

$P(\text{spin a "4"}) = \dfrac{4}{8} = \dfrac{1}{2} = 50\%$

- ⊘ 4
- ⊖ 100%
- ○ 16%
- ● 50% ✓
- ○ Other:

In a game the fair spinner below is spun 440 times. Determine how many times times it is **expected** that it will have an outcome of "1".

$$P(\text{spin }"1") = \frac{\#\text{ Fav outcomes}}{\#\text{ Total possible}} = \frac{1}{8}$$

Spinner showing sections: 4, 4, 3, 1, 4, 3, 3, 4

$$440 \cdot \frac{1}{8} = \frac{x}{440} \cdot 440$$

$$x = \frac{440}{8} = 55$$

- ~~about 40 times unless the ecliptic resonates~~ ?
- 8 times exactly ? Really makes no sense
- ~~4.40%~~
- 55 times
- Other:

don't pick this one! lol

LOL, common sense? The only answer that even comes close to being reasonable is 55 times you can expect to spin a '1'

Grade 10. Solve the proportion below. State your answer.

$$\frac{5}{8} = \frac{x}{20}$$

$$x = ?$$

CRoss MULTIPLY

$$\frac{5}{8} = \frac{x}{20} \; ; \; x = \frac{5 \cdot 20}{8}$$
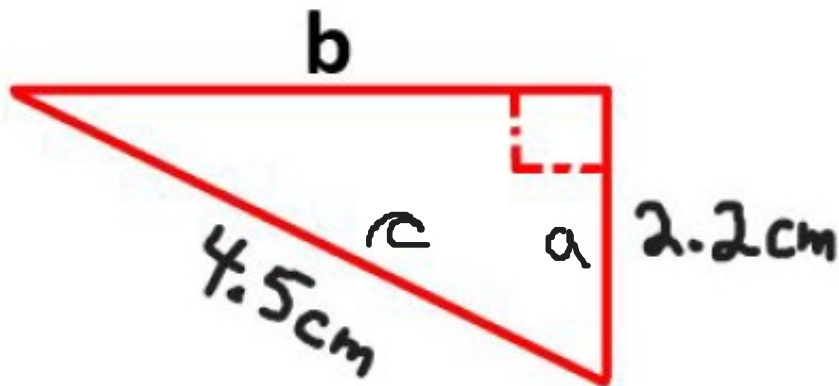
$$x = 12.5$$

Lazy Algebra

Proper Solution:

$$20 \cdot \frac{5}{8} = \frac{x}{20} \cdot 20$$

$$\boxed{12.5} = \frac{100}{8} = \frac{20 \cdot 5}{8} = x$$

Grade 10. Determine the length of side b. Select the best answer. [Hint: *Pythagoras*]

Grade 10

3,000 years ago!

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

where **c** is the length of the hypotenuse and **a** and **b** are the lengths of the shorter two sides

$5^2 = 3^2 + 4^2$
$25 = 9 + 16$
or
$25 - 9 = 16$

25
9
3
5
4
16

b

c

a 2.2cm

4.5cm

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

$4.5^2 = 2.2^2 + b^2$

$20.25 = \quad\quad b^2$

$- 4.84$

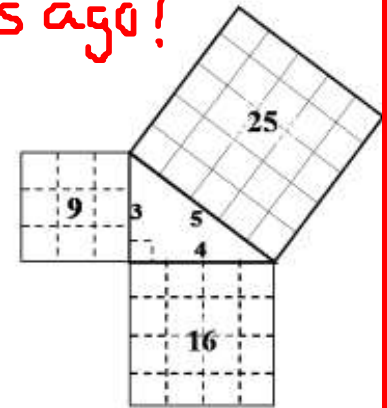$b^2 = 15.41 \quad ; \quad b = \sqrt{15.41}$

$= 3.9255572852$

Round properly!!
As instructed

$; b = 3.93$

Problem Solve. A farmer has 40 animals, chickens and cows. He forgets how many he has of each but he remembers they have 96 legs all together. How many chickens does the farmer have?

○ 20

○ idk

Multiple Choice!! Just pick the one that works

Hint: Chickens have two legs, cows have 4

◉ 32 *(selected, circled in green)*

○ 28

○ 25

○ 8

WRONG!

~~20~~ chickens · 2 legs/chicken + 20 cows · 4 legs/cow
= 40 + 80 = 120 legs ✗ WRONG

32 chickens · 2 legs/chicken + 8 cows · 4 legs/cow
= 32·2 + 8·4
= 64 + 32 = 96   Yes! 32 chickens works!!

Done these about ten times already

Problem Solve. A farmer has 40 animals, chickens and cows. He forgets how many he has of each but he remembers they have 96 legs all together. How many chickens does the farmer have?

○ 20

○ idk

◉ 32

○ 28

○ 25

○ 8

Guess & Check!

Done these about ten times already

# chickens	chick legs	# cows	# cow legs	Legs Total
WRONG ~~10~~?	20	40−10 30	30·4 120 ✗	
Guess again ~~20~~? WRONG!	(40)	20	(80)	(120) ✗ Bzzt
✗ 30? WRONG! close!	60	10	40	100 legs
(32?)	(64)	8	(32)	96 legs ✓

Yes 32 chickens

BONUS 1. [Grade 10, two Bonus marks if you need them]. Determine the
measure of Angle A in degrees. State it below.

Grade 10 Trig

HYP

51cm

OPP

23cm

A

Your answer

(SOH) CAH TOA

Several cheat sheets
Show you

$$sin\angle A = \frac{OPP}{Hyp} = \frac{23}{51}$$

$$\angle A = sin^{-1}\left(\frac{23}{51}\right) = 26.81° \quad TLAR!$$

$$sin^{-1}\left(\frac{23}{51}\right)$$

$$= 26.80660230$$

Bonus 2. [Grade 10] Determine the **Area** of the circle and select the answer below.

A circle with diameter labeled 6.28 cm and radius r.

The only logical answer!

But $A_{circle} = \pi \cdot r^2$
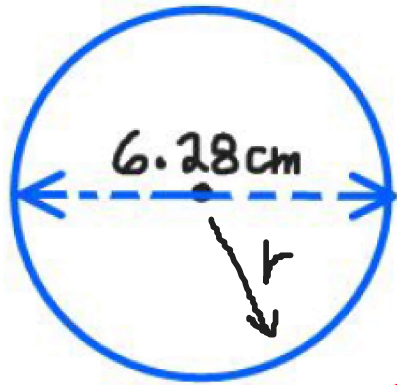
$A = \pi \cdot (3.14 cm)^2$

$A = 30.97\ cm^2$

○ 30.97 cm^2

○ 123.90 cm^2 → doesn't make sense?

○ 19.73 cm^3 ✗ cm^3 is Volume, not area lol.

○ 39.44 cm ✗ cm is length not area!

$\pi \cdot 3.14^2$

$= 30.9748469$

A circle inscribed in a grid labeled 6.28 cm.
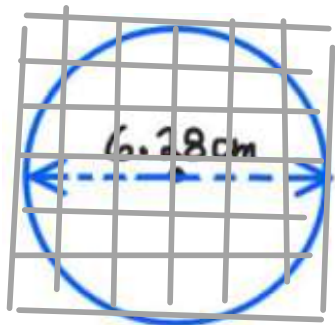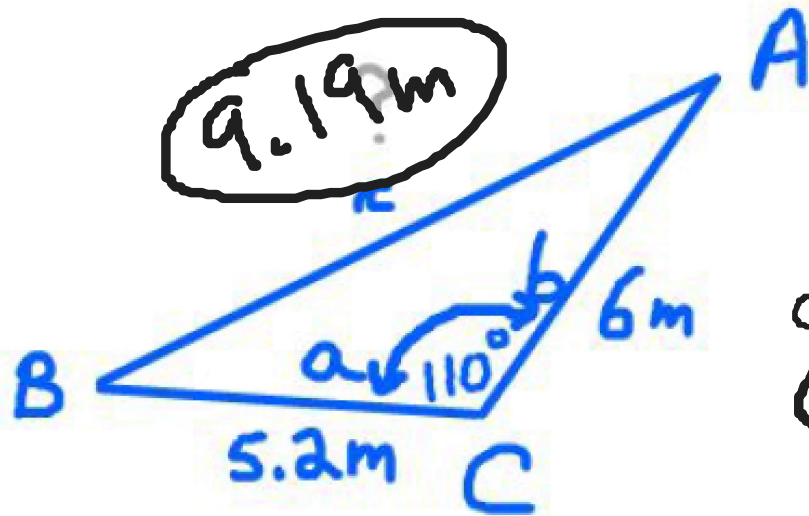
Gotta be less than 36 squares? logic?

Bonus 3. [Grade 11] Go real crazy with the Cosine Law. Solve for side 'c'.
State the answer below.

Fun!

9.19m

A

B

a 110°

b 6m

5.2m C

$c^2 = a^2 + b^2 - 2 \cdot a \cdot b \cdot \cos(C)$
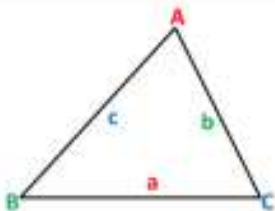
$c^2 = 5.2^2 + 6^2 - 2 \cdot 5.2 \cdot 6 \cdot \cos(110°)$

$c = 9.19 \, m$

$5.2^2 + 6^2 - 2 \cdot 5.2 \cdot 6 \cdot \cos(110)$

$= 84.382056943$

$\sqrt{84.38205}$

$= 9.1859702808$

Gradell

Trigonometry Cosine Law:
Cosine Law for *side a* across from angle A: $a^2 = b^2 + c^2 - 2*b*c*\cos(A)$

Cosine Law for *angle A* given three sides: $\cos(\angle A) = \dfrac{b^2 + c^2 - a^2}{2bc}$ or $\angle A = \cos^{-1}\left(\dfrac{b^2+c^2-a^2}{2bc}\right)$

Various arrangements of formula: $a^2 = b^2 + c^2 - 2*b*c*\cos(A)$
$b^2 = a^2 + c^2 - 2*a*c*\cos(B)$; or $c^2 = a^2 + b^2 - 2*a*b*\cos(C)$