Grade 12 Essential
Quiz Debrief
Week 6

23-05-11

MrF

John borrows $8,500 for 5 years at an interest rate of 6%. How much money has he paid out in monthly loan payments by the end of the loan? (Use tables or use a bank website or an App if you know how). Round to the nearest $20.

- ✗ $8,500 — If there was zero interest, sure!
- ○ $9.020
- ● $9,860 — Really?
- ○ $16,433
- ✗ $1,643 — Doesn't make sense

$19.33 · 8,500/1,000 = $164.31 monthly payment

$164.31/month · 60 months = $9,858.60 ($9,860) Total Paid

Monthly Vehicle Loan Payments per Thousand Borrowed

Interest Rate	Years to Repay Loan 1	2	3	4	5	6
4.00%	$85.15	$43.42	$29.52	$22.58	$18.42	$15.
4.25%	$85.26	$43.54	$29.64	$22.69	$18.53	$15.
4.50%	$85.38	$43.65	$29.75	$22.80	$18.64	$15.
4.75%	$85.49	$43.76	$29.86	$22.92	$18.76	$15.
5.00%	$85.61	$43.87	$29.97	$23.03	$18.87	$16.
5.25%	$85.72	$43.98	$30.08	$23.14	$18.99	$16.
5.50%	$85.84	$44.10	$30.20	$23.26	$19.10	$16.
5.75%	$85.95	$44.21	$30.31	$23.37	$19.22	$16.
6.00%	$86.07	$44.32	$30.42	$23.49	$19.33	$16.
6.50%	$86.30	$44.55	$30.65	$23.71	$19.57	$16.

Any Bank Website

What we use in Applied math

Loan amount

$8,500

Enter the total amount you want to borrow.

Payment frequency

Monthly

How often would you like to make payments?

Interest rate

6

Enter an interest rate.

Amortization

5 years

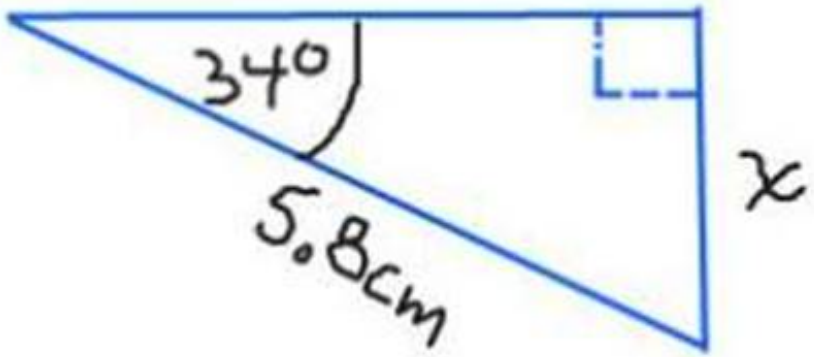
Your estimated monthly loan payment

$164

TVM Calculator

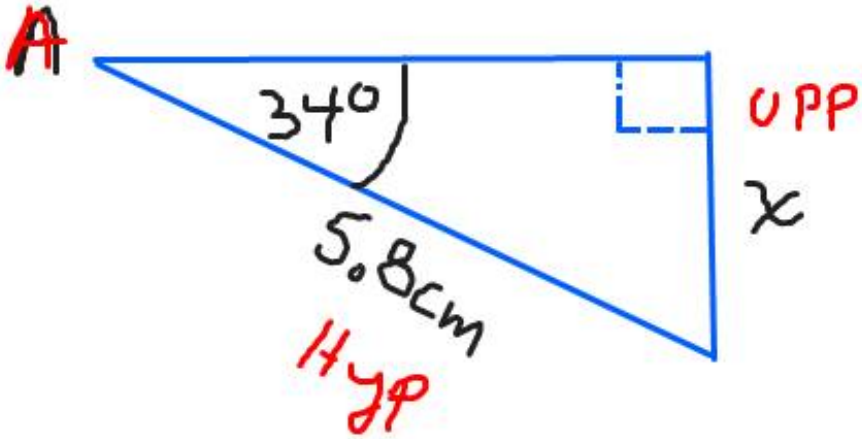
Mode	(•) End ( ) Beginning
Present Value	8,500
Payments	-164.33
Future Value	0
Annual Rate (%)	6
Periods	60
Compounding	Monthly

Solve for length x in the right angle triangle *



- (3.24 cm) ← only logical answer!
- (5.86 cm) ← doesn't make sense
- (56 degrees)
- (2.9 cm) No!
- (11.6 cm) ← How can a short leg be longer than the hypotenuse?

Solve for Length x



$$\sin\angle A = \frac{OPP}{HYP}$$

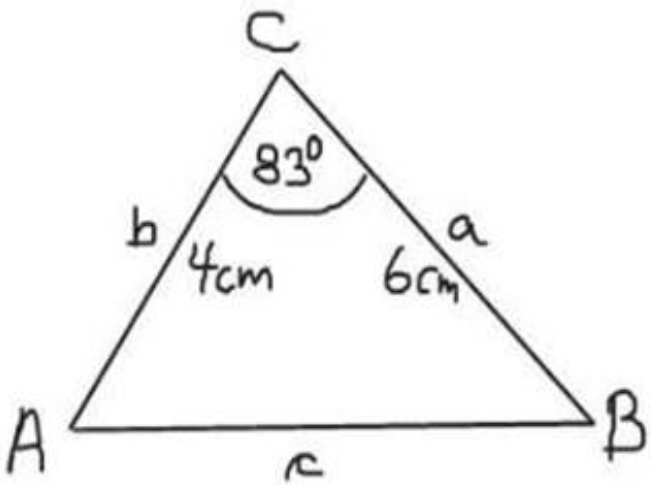
$$5.8 \cdot \sin(34^\circ) = \frac{x}{5.8} \cdot 5.8$$

$$5.8 \cdot \sin(34) = x$$

$$x = 3.24\text{cm}$$

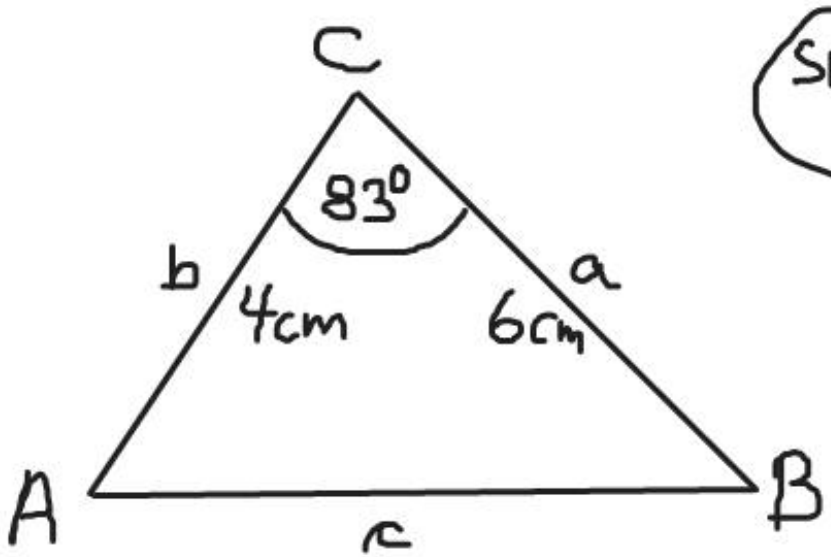
TLAR

Solve for side c using the Cosine Law *



looks about right ← if diagram is correct

- ○ 6.79 cm
- ✗ 46 cm — impossible
- ○ 8.3 cm
- ✗ 10 cm — impossible
- ○ 3.97 cm — "looks" a bit too small?



SAS
Cosine Law

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

$$c^2 = 6^2 + 4^2 - 2 \cdot 6 \cdot 4 \cdot \cos(83^\circ)$$

$$c^2 = 46.15027\ldots$$

$$c = \sqrt{\text{AWS}} \approx 6.79 \text{ cm}$$

TLAR

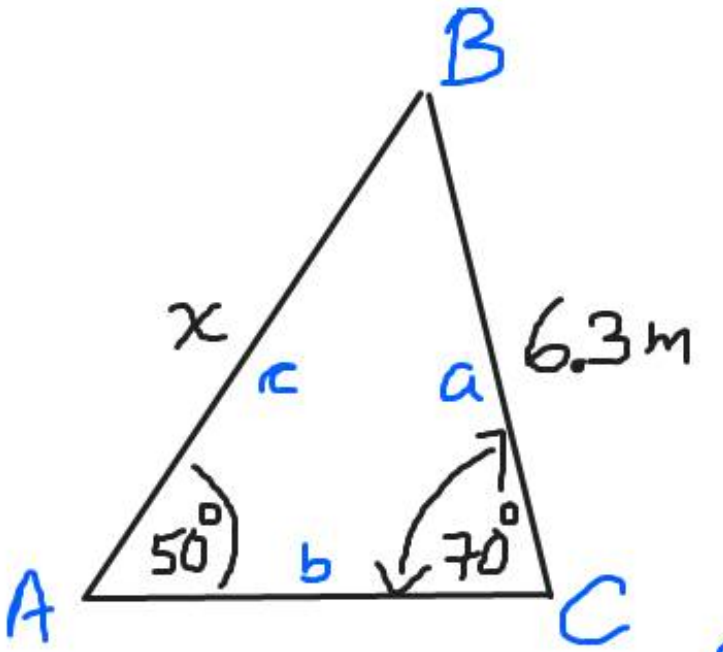
$4^2 + 6^2 - 2 \cdot 4 \cdot 6 \cdot \cos(83$

$= 46.150271516$

$a = \sqrt{46.1502715166}$

$a = 6.793399113$

Solve the triangle using the Sine Law. Round your answer to the nearest 0.01



AAS
Angle Angle Side

Use Side & Angle Pairs!

Sine law

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

$$\frac{6.3\text{ m}}{\sin(50)} = \frac{x}{\sin(70)}$$

$$x = 7.73\text{ m}$$

Two hot dogs and a coke costs $11.50. But two hotdogs plus two cokes costs $13.00. How much does a hot dog cost?

Guess and Check???

Want $13

1 hd	2 hd	1 coke	2hd+1coke	2 hd + 2 coke
✗ $1	$2	11.50 − 2 = $9.50	11.50	$2 + 2 · 9.50 = $21
				Bzzt.
✗ $3 ?	$6	11.50 − 6 = 5.50	11.50	$6 + 2 · 5.50 = $17
				closer!

See a pattern?

✓ ($5) ?	$10	11.50 − 10 = 1.50	11.50	$2·5 + 2·1.50 = $13.00

Yes!

a hotdog costs $5.00 and a coke 1.50

Check: $2·5 + 1·1.50 = 11.50$ ✓ Yes!!

$2·5 + 2·1.50 = 13.00$ ✓

Two hot dogs and a coke costs $11.50. But two hotdogs plus two cokes costs $13.00. How much does a hot dog cost?

l.o.l.

Logic: one extra coke cost an extra $1.50
So a coke is $1.50. If a coke is $1.50
then just two hotdogs must be $10.00. [11.50 − 1.50]
Therefore, if two hotdogs is $10 then one hotdog is $5 ✓

Check: $2 \cdot (5) + (1.50) = \$11.50$ ✓

$2 \cdot (5) + 2 \cdot (1.50) = 13.00$ ✓

10 1 3

Using Symbols instead of words (algebra) x = price one hot dog y = price one coke

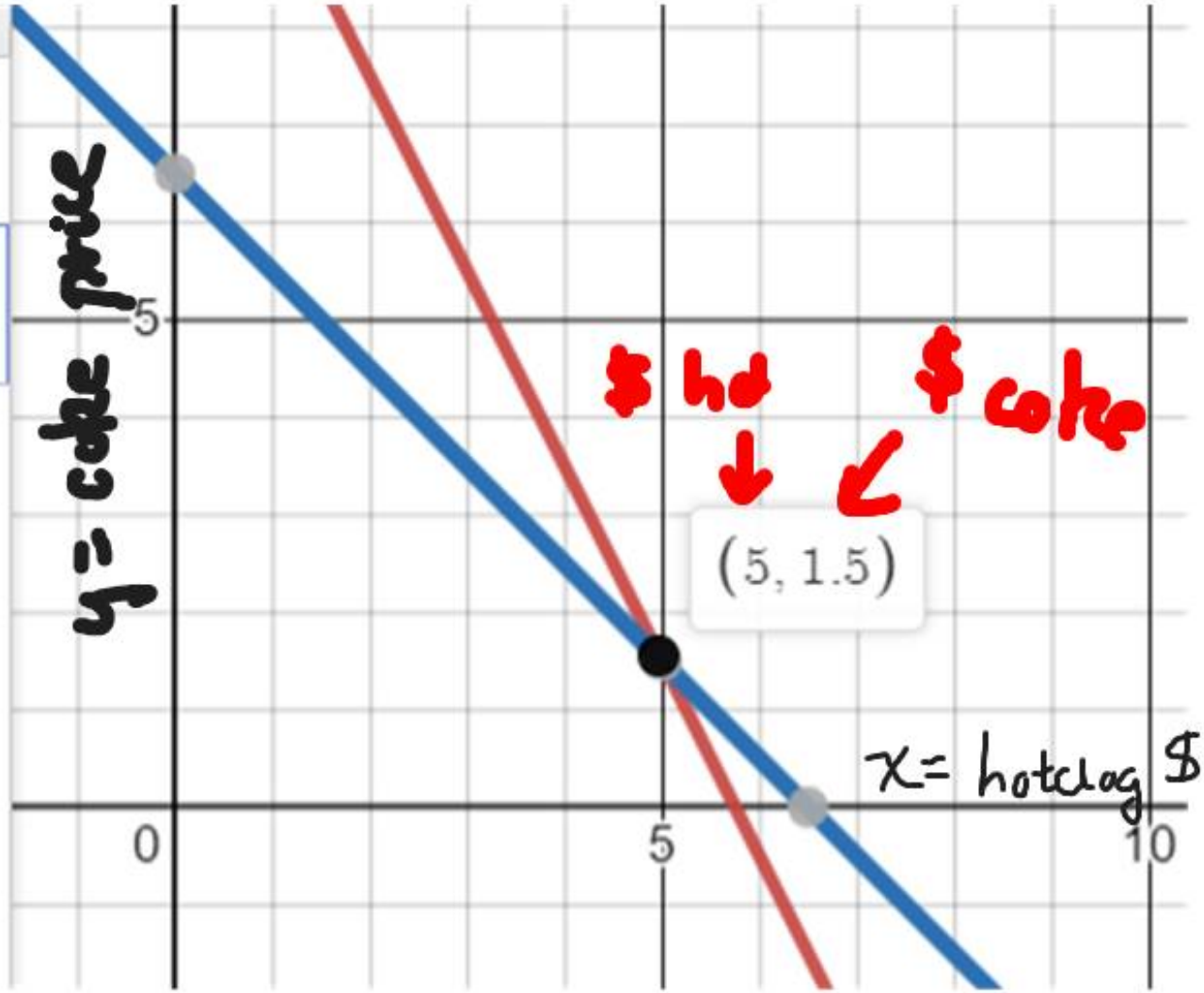
$$\begin{array}{r} 2x + 2y = 13.0 \\ -(2x + 1y = 11.5) \\ \hline y = 1.5 \end{array}$$

Therefore
if $2x + 1.5 = 11.50$
then $\frac{2x}{2} = 10/2$
there $x = 10/2 = 5$

We did some of that in Grade 11 when Graphing Linear Patterns & Gr 12 Applied

$2x + 1y = 11.5$

$2x + 2y = 13$



Janice just finished her math course. She has had four quizzes and a final exam. On her quizzes she had scores of 65%, 72%, 85%, and 20%. The final exam has a triple weight factor (x3) compared to a regular quiz. On her final exam she got a 42%. Her final course mark will be: (Best or closest answer)

- 53%
- 57%
- 368%
- 60.5%

$$\bar{X}_{weighted} = \frac{\Sigma x_i \cdot w_i}{\Sigma w_i}$$

ouch!

$$= \frac{65 \cdot 1 + 72 \cdot 1 + 85 \cdot 1 + 20 \cdot 1 + 42 \cdot 3}{1 + 1 + 1 + 1 + 3}$$

$$= 368/7 = 52.57\%$$

$= 53\%$ best & closest answer

Pass at some schools is 70%!!

Brian wrote an Entrance Exam for a prestigious course. Only the top 20% of applicants are accepted. Mark got 56 out of 80 on the exam. He got a $300 speeding ticket coming to the exam. 260 applicants wrote the exam. Brian plus two others had the same Exam score, and 180 applicants had a score lower than Brian.

Determine Brian's Percentile Rank

- ✗ 180
- ○ 70 th place
- ✗ P300
- ○ 20
- ✗ 69%

? Doesn't make sense

PR is Not a %

$$PR = \frac{(B + \frac{1}{2}(E))}{n} \cdot 100$$

$$= \frac{(180 + \frac{1}{2} \cdot 3)}{260} \cdot 100$$

$$= \frac{181.5}{260} \cdot 100 = 69.81 \rightarrow 70^{th} \text{ Place}$$

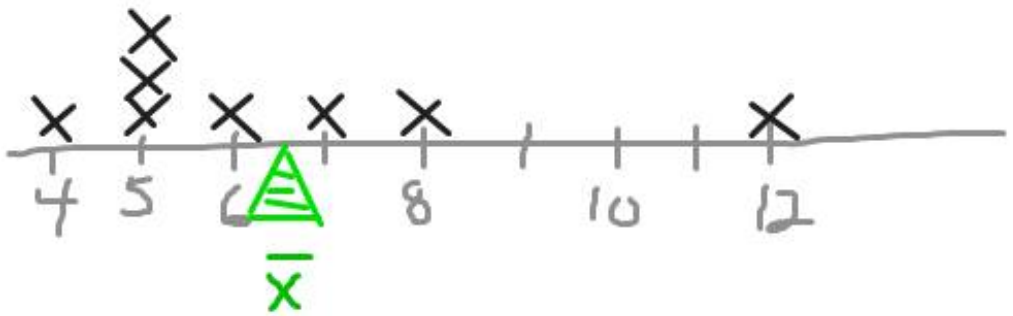
P_{70}

Determine the mean of the following data set:

{ 5, 5, 5, 7, 8, 12, 6, 4}

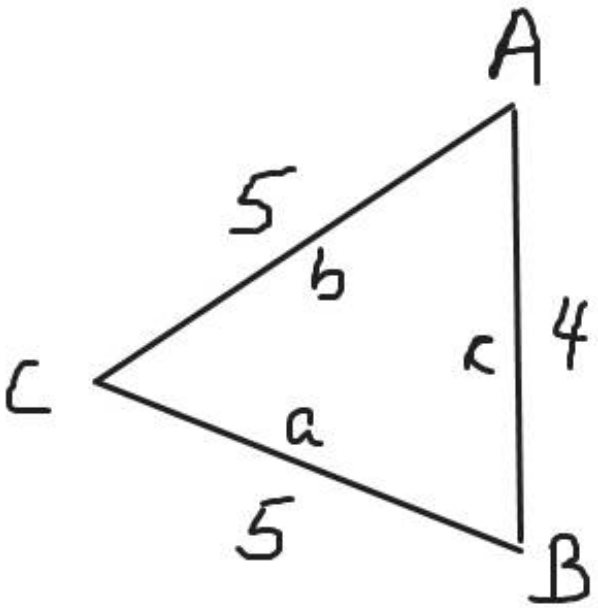
$$\bar{x} = \frac{\Sigma x}{n} = \frac{52}{8} = 6.5$$

Fractions are so much easier!



where it would "balance"

BONUS QUESTION. Determine the measure of angle A. (Extra 2 marks if you need them)



Know 3 sides
use cosine law!

$$\angle A = \cos^{-1}\left(\frac{b^2 + c^2 - a^2}{2 \cdot b \cdot c}\right)$$

$$\angle A = \cos^{-1}\left(\frac{5^2 + 4^2 - 5^2}{2 \cdot 5 \cdot 4}\right)$$

$$\angle A = \cos^{-1}\left(16/40\right) = 66.42^0$$

TLAR