Grade 12 Essential

Quiz Debrief

Week 5

24 Feb 2022

MrF

Grade 12 Essential Week 5 Quiz

Week 5 Quiz! 40 minutes of work packed into 6 hours!

Get your cheat sheet out, paper, pencil, calculator, loan tables, etc.
or if you happen to be in class I will print out a version for you.

Diagrams provided may not be drawn to scale. Units of square cm can be expressed as cm^2 for example

Bonus questions count for 2 marks if you need the marks

'State' the answer means just give the answer, showing actual calculations you did is too cumbersome.

The fuel economy of a two-door convertible is 8.5L/100 km. How many litres of gasoline are required to drive 22,000 km? *

$$\frac{8.5L}{100 \text{ km}} \quad r = \frac{x L}{22,000 \text{ km}}$$

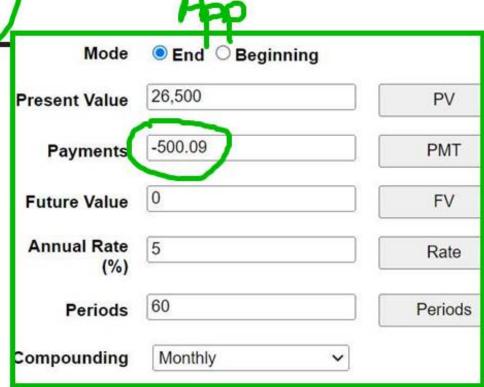$$x = \frac{8.5 L \cdot 22,000 \text{ km}}{100 \text{ km}}$$

$$x = \boxed{1,870 \text{ Litres of gas}}$$

Mark wants to buy a new truck worth $35,200. The dealership offers him a trade-in value of $3,500 for his used car. Calculate the purchase price of the new truck after taxes. (GST:5%; PST:7%) *

$$35,200 - 3,500 = \$31,700 \text{ after trade}$$

$$\$31,700 \cdot 1.12 = \$35,504 \text{ cost of car with taxes}$$

Nancy is purchasing a new vehicle for $26,500 after taxes with financing at 5% for 5 years. State Nancy's monthly payment. [Use the loan tables or if you have access to a bank website or a loan App on your phone try that as a comparison or check]. *

$$18.87 \cdot \frac{26,500}{1,000} = \$500.06 \text{ monthly}$$

App

Mode	● End ○ Beginning	
Present Value	26,500	PV
Payments	-500.09	PMT
Future Value	0	FV
Annual Rate (%)	5	Rate
Periods	60	Periods
Compounding	Monthly	

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	10 Years Monthly	1 Ye Mor
2%	$84.24	$42.54	$28.64	$21.70	$17.53	$9.20	$
3%	$84.69	$42.98	$29.08	$22.13	$17.97	$9.66	$
4%	$85.15	$43.42	$29.52	$22.58	$18.42	$10.12	$
5%	$85.61	$43.87	$29.97	$23.03	$18.87	$10.61	$
6%	$86.07	$44.32	$30.42	$23.49	$19.33	$11.10	$
7%	$86.53	$44.77	$30.88	$23.95	$19.80	$11.61	$
8%	$86.99	$45.23	$31.34	$24.41	$20.28	$12.13	$

The following set of data represents the number of homeruns hit by 9 players on a baseball team. The mean and median are: *

54	12	22
6	45	31
14	47	4

$$\bar{x} = \frac{\Sigma x}{n} = \frac{235}{9}$$

$$\bar{x} = 26.11 \text{ homeruns per player}$$

○ Rank = 31

○ Mean: 22; Median 27

○ Mean: 31; Median 31

○ Mean: 26.11; Median: 22

Determine $\tilde{x}$

4, 6, 12, 14, 22, 31, 45, 47, 54

$$\tilde{x} = 22$$

In a school, 236 students wrote a test. Jesse scored 60 out of 93 on the
test and 127 students scored lower than him. Jesse was the only student
with that test score. State Jesse's percentile rank. *

$$\text{Rank} = \frac{B + \frac{1}{2} \cdot E}{n} \cdot 100 \quad \nearrow$$

$$= \frac{127 + \frac{1}{2} \cdot 1}{236} \cdot 100$$

$$= 54.02 \quad \text{Round up} \quad \boxed{55}$$

I would accept
54 as well

Réjean entered one of his paintings in the provincial art show. The table below shows the points he received and the weight of each category. His weighted mean score for the show is: *

Category	Points Received (Out of 100)	Weight Factor	
Originality	90	30%	→0.3
Design	88	45%	→0.45
Colur	72	25%	→0.25

$$\overline{x}_{weighted} = \frac{\Sigma wf \cdot x}{\Sigma wf} = \frac{0.3 \cdot 90 + 0.45 \cdot 88 + 0.25 \cdot 72}{0.3 + 0.45 + 0.25}$$

$$= \frac{84.6}{1.0}$$

$$= 84.6 \text{ points received.}$$

Juan's personal home has a total assessed value of $260,000. The portioned percentage for residential properties is property is 45%. The municipal tax rate is 12.5 mills. The amount of school division tax due is $1,451.25. The provincial tax credit this year is $775. Calculate Juan's total property tax bill for this year. *

$$\text{Value} \cdot \frac{\text{Portion}}{\%} = \boxed{\text{Portion Assessment}}$$

$$260{,}000 \cdot \frac{45}{100} = \boxed{\$117{,}000}$$

$$\underset{\text{mill rate}}{\$117{,}000 \cdot \frac{12.5}{1{,}000}} = \$1{,}462.50 \quad \text{Municipal tax}$$

$$\begin{aligned}
&+ 1{,}451.25 \quad \text{School tax}\\
\hline
&\$2{,}913.75 \quad \text{Total Tax}\\
&- \underline{\quad 775.00 \quad} \text{Credit}\\
&\$2{,}138.75 \quad \text{Final Annual Tax Bill}
\end{aligned}$$

Determine the monthly payment for a mortgage of $245,000 at an interest rate of 6% for a period of 20 years. [select the best or closest answer][Use an App or bank website if you want] *
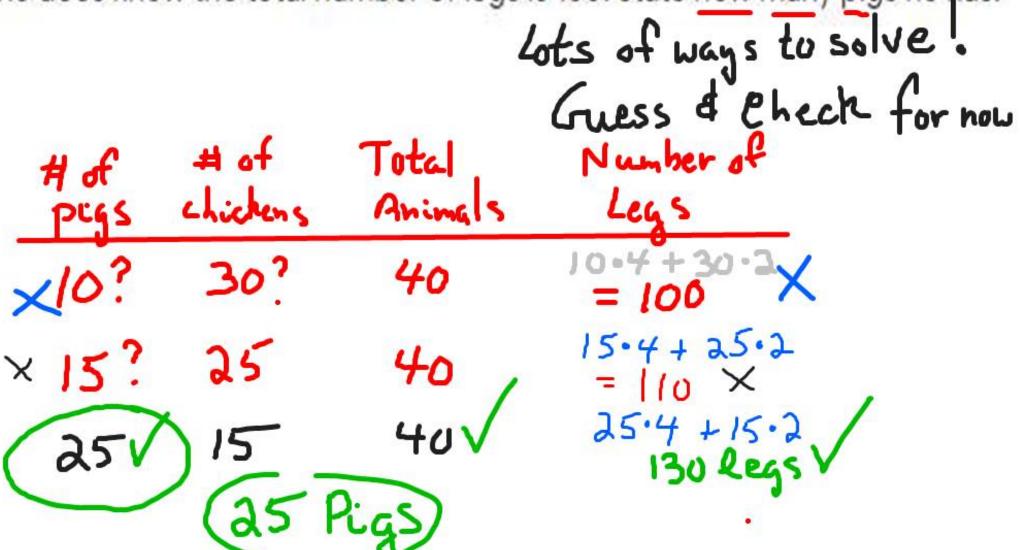
$7.16 · 245,000/1,000 = $1,754.20
using tables.

An App

- ○ $1,755
- ○ $14,700   makes no sense!
- ○ $294   ? Sounds awfully cheap!
- ○ $1,225

Mode ● End ○ Beginning

Present Value 245,000 | PV

Payments -1,755.26 | PMT

Future Value 0 | FV

Annual Rate (%) 6 | Rate

Periods 240 | Periods

Compounding Monthly

Annual Rate	1 Year Monthly	2 Years Monthly	3 Years Monthly	4 Years Monthly	5 Years Monthly	10 Years Monthly	15 Years Monthly	20 Years Monthly
2%	$84.24	$42.54	$28.64	$21.70	$17.53	$9.20	$6.44	$5.06
3%	$84.69	$42.98	$29.08	$22.13	$17.97	$9.66	$6.91	$5.55
4%	$85.15	$43.42	$29.52	$22.58	$18.42	$10.12	$7.40	$6.06
5%	$85.61	$43.87	$29.97	$23.03	$18.87	$10.61	$7.91	$6.60
6%	$86.07	$44.32	$30.42	$23.49	$19.33	$11.10	$8.44	$7.16
7%	$86.53	$44.77	$30.88	$23.95	$19.80	$11.61	$8.99	$7.75
8%	$86.99	$45.23	$31.34	$24.41	$20.28	$12.13	$9.56	$8.36

State two advantages of owning your own home

(1) You can change it
    paint, add stuff,
    renovate, ...

(2) Build equity
    - you eventually own it

(3) Pride!

(4) Can't be evicted!

Bonus [2 extra marks if you need them]. A farmer has 40 animals, some chickens and some pigs. He does not recall how many of each he has but he does know the total number of legs is 130. State how many pigs he has.

Lots of ways to solve!
Guess & check for now

# of pigs	# of chickens	Total Animals	Number of Legs
✗ 10?	30?	40	$10 \cdot 4 + 30 \cdot 2 = 100$ ✗
✗ 15?	25	40	$15 \cdot 4 + 25 \cdot 2 = 110$ ✗
(25) ✓	15	40 ✓	$25 \cdot 4 + 15 \cdot 2$ 130 legs ✓

(25 Pigs)

BONUS - [2 MARKS if you need them]. David is planning on purchasing a house. The monthly mortgage payment will be $975 and the monthly heating costs will be $215. The annual property taxes will be $2,380. Calculate David's Gross Debt Service Ratio (GDSR) if his gross monthly income is $4,200.

Gross Debt Service Ratio.

$$GDSR = \frac{\text{Monthly Mortgage} + \text{Monthly Property Taxes} + \text{Monthly Heating Cost}}{\text{Gross Monthly Income}} \cdot 100; \quad \text{max } 32\%$$

Cannot spend more than 32% of your gross income on a house, shelter.

$$= \frac{(\$975/\text{month} + \$215/\text{month} + 198.33/\text{month})}{4,200} \cdot 100$$

$$= \boxed{33.06\%} \rightarrow \text{too high!}$$

$$\$2380/\text{year} \cdot \frac{1 \ \text{yr}}{12 \ \text{month}} = 198.33$$