**GRADE 12 ESSENTIAL
UNIT B – VEHICLE FINANCE
TDSR & DEPRECIATION**

Name: _____

Date: _____

Notes:
Total Debt to Service Ratio - TDSR.   A percentage that reflects the **total debt** one has compared to their **Gross Income**. If the TDSR exceeds 40% (ie: 0.4) lending institutions will hesitate to loan you money! TDSR is generally calculated using monthly figures and as a percentage.

$$TDSR = \frac{Total \ [Monthly] \ Debt}{[Monthly] \ Gross \ Income}$$

If TDSR>40% (ie: 0.4) then no loan will be provided normally.

In other words, if 40% or more of your Gross Income is needed to cover all your mandatory monthly debt payments then you cannot afford any more debt.

Weekly amounts: every week. To find monthly amounts from weekly; multiply by 52 and divide by 12.
Bi-weekly amounts: every two weeks. To find monthly from bi-weekly; multiply by 26, divide by 12.
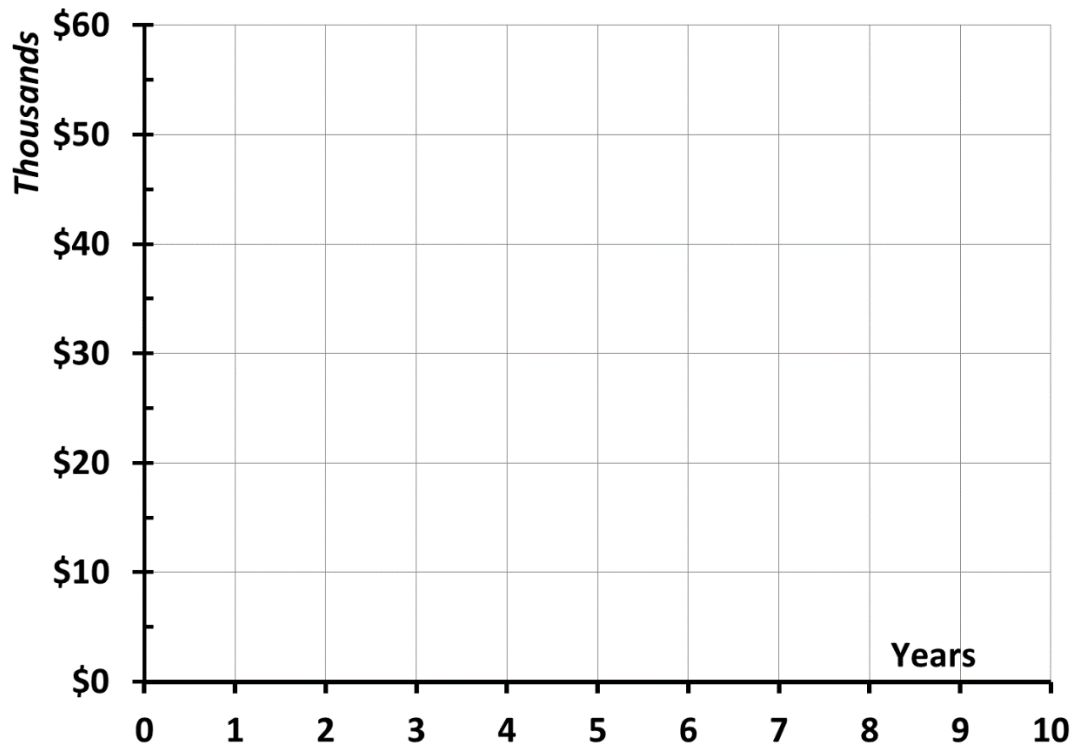
Depreciation Note:
A handy formula to calculate the value, **V**, of a depreciating asset is:
$V = V_0 * (1 - d)^n$; where **V_0** is the initial value, ; '**d**' is the annual depreciation percentage as a decimal, and '**n**' is the number of years. It is an 'exponential decay'. (way fancy, same way your coffee cools!)

1. Dave buys his dream car with money he inherited from his father; a new BMW that had an MSRP of $52,000. He paid full price cash plus the sales taxes (PST and GST for total of 13%). The 'book value" of the car depreciates by 15% per year on year. (hint if it loses 15% per year then it keeps 85%)

a.   how much did Dave pay for his BMW?

b.   how much is the car worth (the value) after one year?
[The value of a car is *not* its price with taxes, taxes add no value to the car!]

c.   how much is the car worth after two years?

d.   how much is the car worth after four years?

e.   how much is the car worth after eight years?

f.   make a graph of the depreciating value of the BMW below:

2. Complete the table below for a depreciating asset

	V_0 Initial Value	d, Annual Depreciation Rate, (% / yr)	n Years	V Value after 'n' years
a	24,000	10%	5	
b	52,000	20%	8	
c	34,500	23%	10	
d	50,000 *Advanced!!*	20%	*Guess and check! Solve for n*	$10,000

Show work area:

3. Dana and Kyle have a joint gross income of $5400 per month. They rent an apartment at $300 per week. Kyle has child support payments of $400 per month from a prior relationship. Dana is paying off a credit card at $150 per month (the minimum payment). They are looking at leasing a car for $350 per month so Dana can travel weekends to visit her sick mom.

      a.   calculate their TDSR if they were to lease the car.

      b.   will the leasor likely allow them to lease the car?

      b.   what might happen to worsen their TDSR?

      c.   what could they do to improve their TDSR?

4. Karen and Don are married and have a mortgage of $800 per month. Property tax (for city services) is $3,400 annually paid on equal monthly installments. Their gross income is $47,000 per year. They have one car already paid off but want to get another car so Karen can help transport the grandkids around. They will need to finance the car with a loan.

What is the highest amount of monthly loan debt they can expect to be approved to purchase the car?

5. Charlene needs a reliable car to get to work. She earns *$1,850* every two weeks (*ie: bi-weekly*) from her job and gets a CCB (Child Benefit) of $480 per month. She pays $150/week for day care and has a monthly $105 cell phone contract she cannot get out of. Her rent is $1200 per month. She will take a loan for five years for the full cost of the car. PST and GST are 13%.

     a.   what loan can she afford based on TDSR?

     b.   what could she do to improve this situation?

6. Complete the following TDSR Table

	TDSR %	Debt (Bills) Rent	Heat	Other	Possible Loan	Gross Income
a.		$900 / month	$80 / month	$200/month	$250 / month	$32,000 per year
b.		$1000 / month	$70 / month	0	$325 / month	$1650 bi-weekly
c.	40%	$245 / week	0	0		56,000 per year
d.	40%	$1,400 / month	$65 /month	$ 250 / month		$2500 / month
e.		$170 / week	0	0	$200	$3,000 / month

Work area (show work)

7. Convert the given following periodic amounts to the indicated periodic rates (use 52 weeks per year)

a. $52,000 / year = _____ / month

b. $60,000 / year = _____/ month *or* _____ / week

c. $820 / week = _____ / month *or* _____ / year

d. $1,850 bi-weekly = _____ / month

e. $350 bi-weekly = _____ / month *or* _____ / year

f. $600 / week = _____/ month *or* _____ / year

Selected Answers

1a. $58,760   1b. $44,200   1c. $37,570   1d. $27,144.33
1e. $14,169.51

2a. $14,171.76   2b. $8,724.15   2c. $2,527.71
2d. About 7.2 years (just keep guessing and checking till you get close!)

3a.   0.41 or 41%   3b. Probably No
3c & d. various answers

4. $483.84 is the maximum extra debt they can afford

5.   She is already *$159.67* beyond a reasonable debt load! (that is why it was a negative amount!) No loan for her. However, if she were to share her rented space with a friend and she only paid $600 then she would be able to cover her $159.67 in bills plus get a ~$540/month loan.

6. a. 54%;   b. *39%*;   c. $805/month;
d. negative $715/month (way too much debt already How can he even afford that rent??!);
e. 31%