

# MTH-2101

## Pretest DA

- 1) (5 marks) If the Density of a set of substances is always 20 times the mass:

D = Density

M = Mass      The equation  $D = 20M$       is a model that can be used in this situation.

Fill in the following two tables:

M	D
0.1	
1.5	
5	
20	
80	

M	D
	200
	120
	40
	8
	4

- 2) (7 marks) Let's practice our Volume formulas for 3-Dimensional shapes. Find the Volumes:

Right Prism	length = 10m, width = 8m, height = 2m
Cube	side length = 20m
Half-Cylinder	height = 10m, radius = 4m
Cone	height = 10m, radius = 3m
Sphere	Diameter = 12m

- 3) (4 marks) What if you know the Volume and you are asked for one of the other measures?

If a cylinder has a height of 10m and its Volume is  $1131\text{m}^3$ , what is the length of its radius?  
Round your answer to the nearest tenth.

If a cone has a Volume of  $94.2\text{m}^3$  and a radius of 3m, what is its height? Round your answer to the nearest unit.

- 4) (4 marks) Simplify:

$20x - 2(x - 5) = 82$	$\frac{x + 2}{6} = \frac{x - 12}{5}$
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5) (10 marks) Let's practice our Area formulas for 2-dimensional shapes:

Rectangle	$\ell = 10, w = 4, A = ?$	
	$A = 20, w = 2, \ell = ?$	
	$A = 80, B = 20, h = 2, b = ?$	
	$A = 100, b = 16, h = 4, B = ?$	
Rhombus	$D = 10, d = 8, A = ?$	
	$A = 30, D = 10, d = ?$	
Square	$s = 10, A = ?$	
	$A = 144, s = ?$	
Triangle	$b = 12, h = 6, A = ?$	
	$A = 40, b = 10, h = ?$	
Circle	$r = 4, A = ?$	
	$D = 16, r = ?$	

6) (5 marks) I earn \$20/hour to tutor students. Make a linear model of this situation. Remember to define the variables.

Now use your model to answer:

- How much will I earn in  $8\frac{1}{2}$  hours?
- If I earned \$400 last month, how many hours did I tutor?

7) (40 marks) I am going to do a vacation, camping up north. Should I buy a trailer, or rent a recreational vehicle? The following are the facts I must consider:

My budget for the trip is \$1400.00	If I use the RV, my camping fees will be \$30/night.	I would like to visit the furthest I can manage of these possible towns:	
I have 2 weeks of vacation time.	If I buy the trailer, I will stay in rental cottages that cost \$59/night.	Mont-Laurier	206km
		Rimouski	572km
		Rouyn-Noranda	603km
		Riviere de Loup	463km
The cost of gasoline seems stable at \$1.20/L	The fuel consumption of the car while pulling the trailer is 9L/100km.	RV rental costs \$300/week	
The trailer costs \$460.00	The fuel consumption of the RV is 28L/100km.		

8) (10 marks) My recipe for soil in my tomato gardens uses the following algebraic model:

$x$  = the amount of peat moss

$y$  = the amount of perlite

$$y = 0.7x$$

My larger tomato garden bed required 40L of perlite. My second, smaller tomato garden bed requires only one quarter as much peat moss as the larger bed required.

How much perlite do I need for the smaller garden bed?

9) (15 marks) My blueberry plants do not use the same recipe as my tomato plants. They need more acidic soil, so I need more peat moss.

The peat moss is directly proportional to the amount of compost. Here are some examples:

I mix 8L of peat moss to mix with 10L of compost.

I mix 28L of peat moss to mix with 35L of compost.

I mix 12L of peat moss to mix with 15L of compost.

Make an algebraic model that can be used to figure out the number of Litres of peat moss as a function of the number of Litres of compost. Then use your model to tell me how much peat moss I need to fill 4 garden beds which each have a length of 2m, a width of 1.2m and have already been partially filled with peat moss to a height of 10cm.