

# MTH-2101

## Pretest DB

- 1) (5 marks) If the cost of a toy is always 4 times the cost of its packing materials:

T = Cost of toy

M = Cost of materials

The equation  $T = 4M$  is a model that can be used in this situation.

Fill in the following two tables:

M	T
0.2	
1.3	
6	
10	
40	

M	T
	120
	32
	12
	2
	0.4

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

Right Prism	length = 20m, width = 14m, height = 3m	
Cube	side length = 11m	
Cylinder	height = 4m, radius = 3m	
Half-Cone	height = 10m, radius = 5m	
Sphere	Diameter = 5m	

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

If a cylinder has a radius of 3m and its Volume is  $141.3\text{m}^3$ , what is its height? Round your answer to the nearest tenth.

If a cone has a Volume of  $50.24\text{m}^3$  and a height of 12m, what is the length of its radius? Round your answer to the nearest unit.

- 4) (4 marks) Simplify:

$5x - 4(x - 3) = 22$	$\frac{x - 3}{3} = \frac{x - 4}{8}$
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5) (10 marks) Let's practice our Area formulas for 2-dimensional shapes:

Rectangle	$\ell = 12, w = 5, A = ?$	
	$A = 60, \ell = 12, w = ?$	
Trapezoid	$B = 10, b = 8, h = 4, A = ?$	
	$A = 40, B = 10, b = 6, h = ?$	
Rhombus	$D = 9, d = 7, A = ?$	
	$A = 80, d = 10, D = ?$	
Square	$s = 9, A = ?$	
	$A = 225, s = ?$	
Triangle	$b = 10, h = 7, A = ?$	
	$A = 60, h = 15, b = ?$	
Circle	$A = 153.86, r = ?$	
	$r = 3, D = ?$	

6) (5 marks) I earn \$18/gnome to make gnome statues for peoples' yards. Make a linear model of this situation. Remember to define the variables.

Now use your model to answer:

- How much will I earn if I make 12 gnomes?
- If I earned \$378 last month, how many gnomes did I make?

7) (25 marks) 4 neighbors need fences built. 2 companies are available: Company A charges 10\$/foot plus a set fee of \$240, and Company B charges 12 \$/foot plus a set fee of \$100. These costs are represented by the following equations:

$x$  = number of feet

$y$  = cost of fence

A:  $y = 10x + 240$

B:  $y = 12x + 100$

The lengths of fences are shown below:

Neighbor 1:	Neighbor 2:	Neighbor 3:	Neighbor 4:
200 feet	100 feet	70 feet	50 feet

Which company should each neighbor choose in order to spend less money? What general rule would you recommend, to help a customer choose the cheaper fence-building company?

- 8) (15 marks) My aquarium is full, and contains 250L. I am emptying it into a big garbage can that already has 44L of water in it. I am using a hose that allows a flow rate of 5L/minute.

Make algebraic models for each container that represent the number of Litres as a function of the number of minutes. Then calculate how long it will take before the aquarium is empty.

- 9) (10 marks) My recipe for homemade orange soda uses the following algebraic model:

$x$  = grams of sugar

$y$  = grams of orange zest

$$y = 0.2x$$

The amount I need for a party used 4g of orange zest and used up most of the sugar I had. The next day I used all of the remaining sugar, which was one fifth as much sugar as I used for the party, to make orange soda for a friend at work.

How much sugar do I need for the soda for the friend? To answer, use the algebraic model twice, first to find the amount of sugar used for the party, and then to find the amount of orange zest used for the friend.

- 10) (15 marks) In the recipe for rice cereal squares, the amount of cereal is directly proportional to the amount of marshmallows. Here are some examples from the school cafeteria:

Mix 44L of marshmallows with 36L of rice cereal.

Mix 38.5L of marshmallows with 31.5L of rice cereal.

Mix 55L of marshmallows with 45L of rice cereal.

Make an algebraic model that can be used to figure out the number of litres of marshmallows as a function of the number of litres of rice cereal. Then use your model to tell me how many litres of marshmallows I need if the amount of cereal I have available would fill 3 cylindrical jars which each have a height of 0.4m and a radius of 10cm.