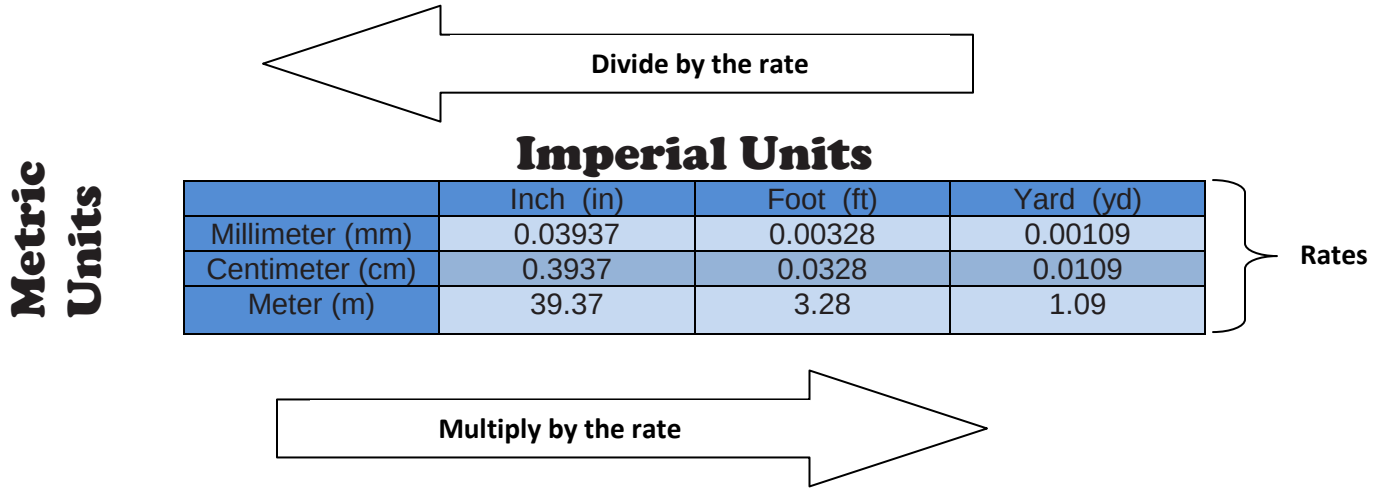
Name: _____ Date: _____

Green and Clean Landscaping: *Unit Conversions*



	Inch (in)	Foot (ft)	Yard (yd)
Millimeter (mm)	0.03937	0.00328	0.00109
Centimeter (cm)	0.3937	0.0328	0.0109
Meter (m)	39.37	3.28	1.09

Metric	Metric
10 Millimeters (mm)	1 Centimeter (cm)
100 Centimeters (cm)	1 Meter (m)
1,000 Meters (m)	1 Kilometer (Km)

Imperial	Imperial
1 foot (ft)	12 inches (in)
1 yard (yd)	3 feet (ft)
1 mile (mi)	1760 yards (yd)

Example:

1. ***Convert 73 cm into inches***

   Start at on the left side of the table in the centimeter row. Follow the row across to inches. The conversion rate is 0.3937.

   73 cm x 0.3937 = 28.74 inches

2. ***Convert 28.74 inches into feet***

   When converting from *inches* to *feet*, we are moving from a small unit to a large unit. We need to by the number of inches in a foot.

   28.74 in ÷ 12 in 2.4 feet

Practice:

a) 1.5 m = _____ cm

b) 36.8 km = _____ m

c) 30 cm = _____ m

d) 14 in = _____ ft

e) 10 yd = _____ ft

f) 8 ft = _____ in

g) 17 m = _____ ft

h) 100 cm = _____ in

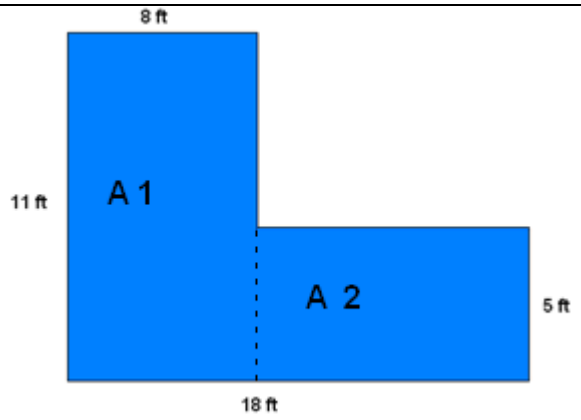
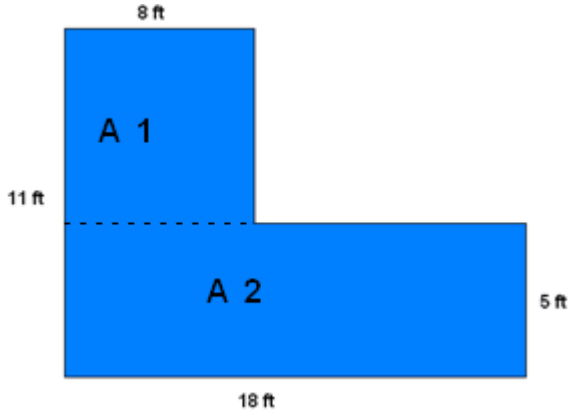
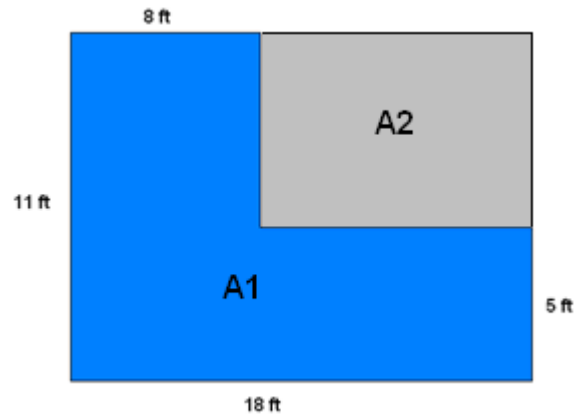
i) 5 yd = _____ m

Name: _____ Date: _____

Green and Clean Landscaping: *Area of Composite Figures*

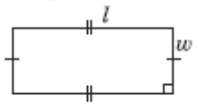
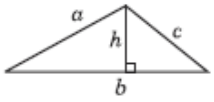
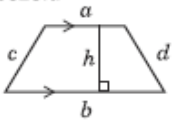
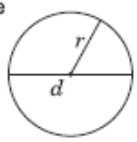
Often decks, patios, pathways and other garden components are made up of various shapes. To calculate how much material you need to build (or remove) certain components, you may be required to break an object into manageable shapes for calculation.

Below is a simple composite shape. Notice how the shaded area can be calculated three different ways. Calculate the area of the shape given below the three different ways shown in the table. ***Remember*** $A_{rectangle}$ ***= length*** **x** ***width***

	$Area_{total} = A_1 + A_2$
	$Area_{total} = A_1 + A_2$
	$Area_{total} = A_1 - A_2$

Name: _____ Date: _____

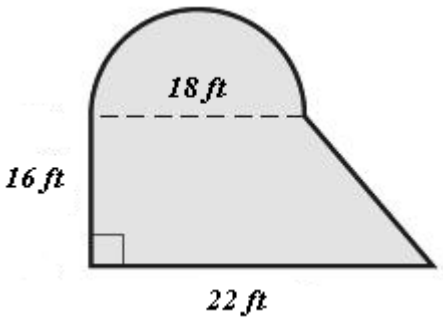
Green and Clean Landscaping: *Area of Composite Figures*

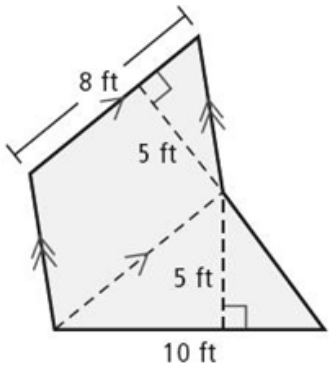
Geometric Figure	Perimeter	Area
Rectangle 	$P = l + l + w + w$	$A = l \cdot w$
Triangle 	$P = a + b + c$	$A = \frac{b \cdot h}{2}$
Trapezoid 	$P = a + b + c + d$	$A = \frac{(a + b) \cdot h}{2}$
Circle 	$C = \pi d$ *or* $C = 2\pi r$	$A = \pi r^2$

http://www.eqao.com/pdf_e/09/Ffla2_9e_0110_web.pdf

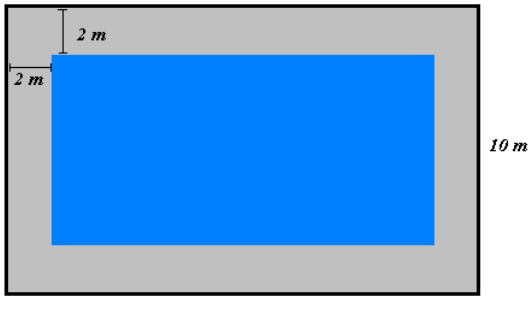
Practice:

Find the area of the shaded region below. Show all your work on a separate piece of paper.





http://static1.tenmarks.com/static/albums/Extending-Perimeter-Circumference-and-Area/Composite-Figures-practice.html

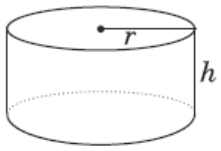
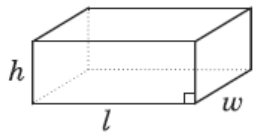
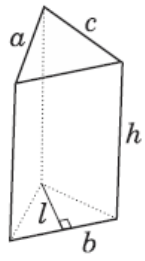


Name: _____ Date: _____

Green and Clean Landscaping: ***Volume and Surface Area***

When landscaping, you may need to remove (or add) volumes of dirt to change the land for more desirable look and use. Nature usually does not create perfect 3-Dimensional figures. Using your knowledge of composite shapes, you may be required to break up a landmass into manageable shapes for calculation.

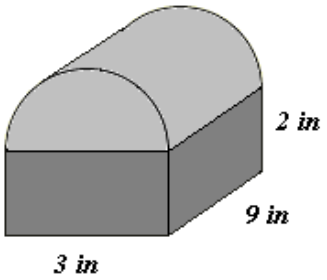
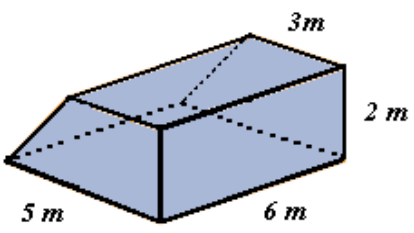
Below are samples of composite 3-Dimensional shapes. Calculate the Volume and Surface Area of each shape given below.

Geometric Figure	Surface Area	Volume
Cylinder 	$A_{base} = \pi r^2$ $A_{lateral\ surface} = 2\pi rh$ $A_{total} = 2A_{base} + A_{lateral\ surface}$ $= 2\pi r^2 + 2\pi rh$	$V = (A_{base})(\text{height})$ $V = \pi r^2 h$
Rectangular prism 	$A = 2(wh + lw + lh)$	$V = (\text{area of base})(\text{height})$ $V = lwh$
Triangular prism 	$A_{base} = \frac{1}{2} bl$ $A_{rectangles} = ah + bh + ch$ $A_{total} = A_{rectangles} + 2A_{base}$ $= ah + bh + ch + bl$	$V = (A_{base})(\text{height})$ $V = \frac{1}{2} blh$ or $V = \frac{blh}{2}$

http://www.eqao.com/pdf_e/09/Ffla2_9e_0110_web.pdf

Practice:

Find the volume and surface area of the figures below. *Use a separate sheet if needed.*

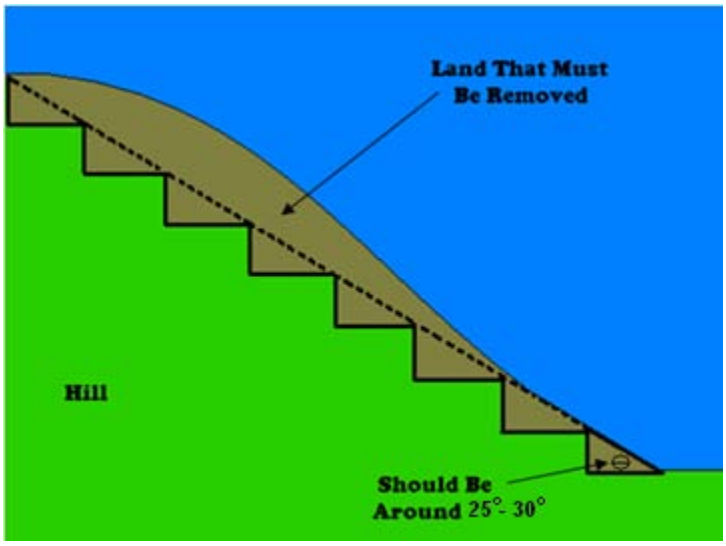
Composite Shape	Formulas Needed	Calculations
		
		

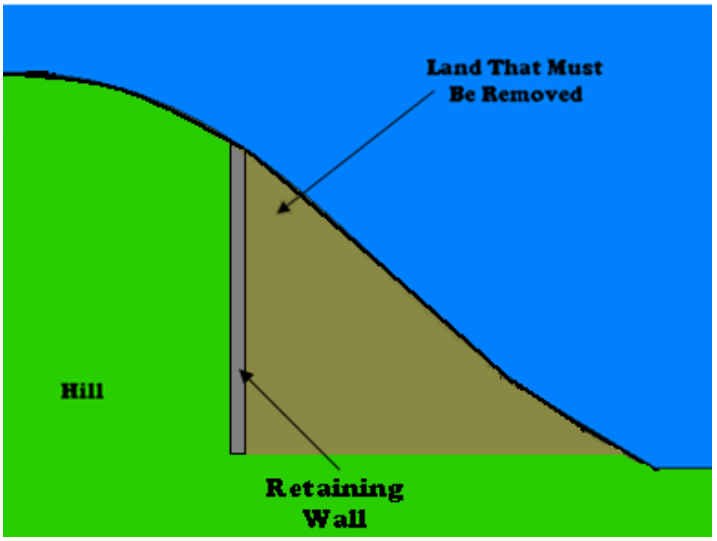
Name: _____ Date: _____

Green and Clean Landscaping: ***Stairs and Retaining Walls***

Creating stairs while landscaping the earth is a crucial skill that not only adds aesthetically to a garden, but also provides easier access to around gardens and paths. Appropriate planning and calculating must take place before digging to ensure the stairs function appropriately.

Retaining walls are used to support or prevent soil or water from moving in certain directions. They are also used to create useful land at different elevations.



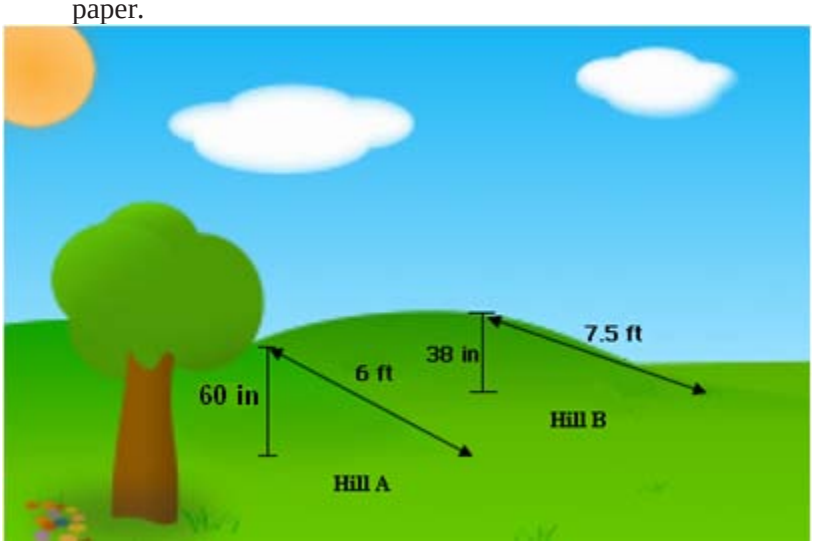


Some Considerations:

- Incline should be around 25-30^{o}
- Height of each step (rise) should be 10” – 12”
- Length of each step (run) should be 6” – 8”
- Trigonometry can be used to find angle of incline
- Triangular and rectangular prisms are most often used to estimate the volume of land to be removed.
- Triangular prisms are most often used to estimate the volume of earth needed to be removed

Practice:

Answer the questions using the diagram (not to scale) below. Complete all work on a separate sheet of paper.



A) What is the height of each hill in feet?

B) Which hill is more suitable for a stairway?
(Hint: Calculate the angle of incline)

C) Sketch a side profile of the stairway and retaining wall.
(include all dimensions)

D) Approximately much dirt must be removed to create the stairway and wall?

Name: _____ Date: _____

Green and Clean Landscaping: ***Creating a Garden***

Now that you have reviewed some of the essential skills needed for landscaping, it's your time to shine! Your client has provided you with a topographic sketch of their yard. They have allowed you to be as creative as you wish. However, they ask that the garden has the following requirements:

- A pond
- Stairs (make sure the angle of incline is approx 30^{o})
- A retaining wall on the greatest slope
- A lookout at the top of the hill (stone or concrete)
- Flower bed
- Patio (stone or concrete)
- Walkways around the garden (stone or concrete)
- At least 4 trees and 6 shrubs

Things to Remember:

** All items must be sketched in colour and labeled on the map provided below.
** Side profiles must be labeled and completed with dimensions for the retaining wall and stairs.
** A materials list must be submitted to the client with all applicable calculations.
(i.e. How much stone is needed for the patio? How much dirt needs to be removed from steps and retaining wall)