Mathematics 20-3
Final Exam Formula Sheet

Unit 1 – Slope & Rate of Change

Slope Calculations/Formula's:

$$slope = \frac{rise}{run} \qquad slope = \tan(\theta)$$

$$slope = \frac{y_2 - y_1}{x_2 - x_1}$$

When you are given two coordinates of a line in the form (x, y)

Percentage Grade/Angle of Elevation Formula's:

$$\%Grade = slope \times 100$$

$$\%Grade = \tan(\theta) \times 100$$

$$\text{Angle of Elevation} = \tan^{-1}\left(\frac{rise}{run}\right)$$

Length of a Line Formula:

$$\text{Length} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

When you are given two coordinates of a line in the form (x, y)

Unit 2 – Graphical Representations
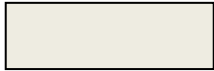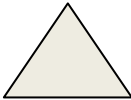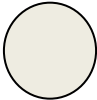
$$\% = \frac{score}{total} \times 100$$

$$angle = \frac{\%}{100} \times 360$$

$$Number\ of\ items = \frac{\%}{100} \times total$$

Unit 3 – Surface Area / Volume / Capacity

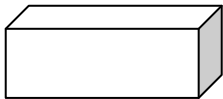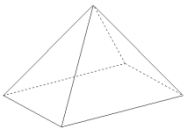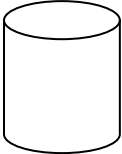### 2-D Shapes (Units are squared)

$$\boxed{mm^2 \mid cm^2 \mid m^2 \mid km^2}$$
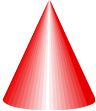
Shape	Area/Circumference Formula
Rectangle	Area = length x width
Triangle	Area $= \dfrac{base \times height}{2}$
Circle	Circumference = $2\pi r$ or πd Area = πr^2

3-D Shapes (Units are cubed)

$$mm^3 \mid cm^3 \mid m^3 \mid km^3$$

Shape	Surface Area Formula	Volume Formula
Rectangular Prism	**Sum of all the areas of the faces**	V = $length \times width \times height$
Square/Rectangular Pyramid	**Sum of all the areas of the faces**	V = $\dfrac{length \times width \times height}{3}$
Right Circular Cylinder	$SA = 2\pi r^2 + 2\pi rh$	$V = \pi r^2 h$
Right Circular Cone	$SA = \pi r^2 + \pi rs$	$V = \dfrac{\pi r^2 h}{3}$
Sphere	$SA = 4\pi r^2$	$V = \dfrac{4\pi r^3}{3}$

Unit 4 – Trigonometry

Finding Sides

$$\sin(\theta) = \frac{opposite}{hypotenuse} \qquad \cos(\theta) = \frac{adjacent}{hypotenuse} \qquad \tan(\theta) = \frac{opposite}{adjacent}$$

- Remember to use cross multiplying with your trig ratios after you have filled in all of your numbers

Pythagorean Theorem
$$a^2 + b^2 = c^2$$ remember that c is the <u>hypotenuse</u>

Finding Angles

$$\theta = \sin^{-1}\left(\frac{opposite}{hypotenuse}\right) \qquad \theta = \cos^{-1}\left(\frac{adjacent}{hypotenuse}\right) \qquad \theta = \tan^{-1}\left(\frac{opposite}{adjacent}\right)$$

Unit 5 – Scale Representations

Finding A Scale Factor

Scale Factor = $\dfrac{measurement(diagram)}{measurement(original)}$

<u>Note: Always remember to reduce the fraction</u>

Enlargement / Reduction

Enlargement: The bigger number is first in the scale factor (**4:1 or** $\frac{4}{1}$)

Reduction: The smaller number is first in the scale factor (**1:4 or** $\frac{1}{4}$)

Elevations (Views)

Elevations are 2D drawings of common views of 3D shapes. The elevations most commonly drawn are
front, top, side.

Unit 6 – Personal Finance

Simple Interest

$$I = \Pr t$$

- I = Interest ($)
- P = Principle (Starting amount $)
- R = Interest Rate (As a decimal)
- T = Time (In years)

Compound Interest

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

- A = Final Amount (Interest & Principle Combined $)
- P = Principle (Starting amount $)
- R = Interest Rate (As a decimal)
- N = Number of compounding periods per year
- T = Time (In years)