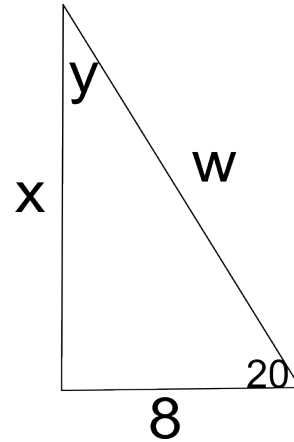
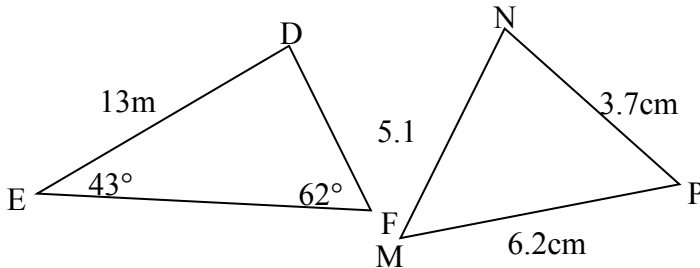


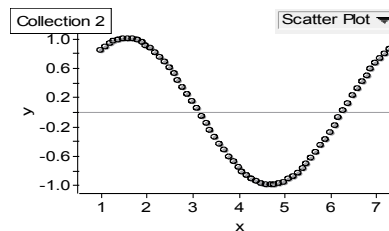
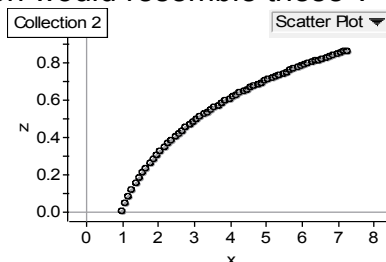
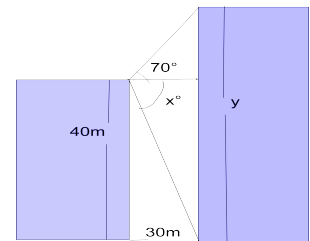
MCT4C Exam Review

Trigonometry

1. Know the meaning of SOH CAH TOA.
2. Use the above to find the value of missing side lengths and missing angles. Example: find the measure of w , x , y
3. Use the sine and cosine laws to solve triangles. Find angles DEF, MNP, and sides edf, mnp. State which law you used for each.



4. Be able to graph sinusoidal functions (sine, cosine and tangent). Example: Graph $y = \sin \theta$, $y = \cos \theta$, $y = \tan \theta$.
5. Be able to apply transformation on sine and cosine curves.
 - a) Ex1: graph: $y = 2\sin \theta - 30 + 5$, $y = 3\cos 3\theta$
6. Be able to create an equation of a sine/cosine function based on an application (ferris wheel). Example: Create an equation that models the following: A Ferris wheel has a radius of 20 m and rotates at the rate of one revolution every 100 s (period is 100). At the bottom of the ride, the passenger is 5 m above the ground. You start your ride from the bottom of the wheel.
7. Know the meaning of the C.A.S.T. rule and be able to explain how it works.
8. Use the C.A.S.T. rule to find the measure of obtuse angles or greater in exact form. Example: Given that $0^\circ \leq B \leq 180^\circ$, determine the value(s) of $\angle B$ to the nearest degree if $\sin B = 0.5329$.
9. Solve simple trigonometric equations. Example: If $\cos x = 0$, find x , if $0 \leq x \leq 90$.
10. Understand the difference between periodic and sinusoidal.
11. Answer questions based on how tall a building is: Example: Based on the following diagram, find the height of the taller building.
12. Be able to interpret data given and create a function based on the data. Example: Given the adjacent graphs, what type of function would resemble these?



Exponential and Logarithms

1. Know all the laws (product, quotient, power) for both logarithms and exponential functions.

1. Evaluate simple and complex logarithmic functions exactly. Example1: $\log \frac{1}{100}$.

Example2: $2\log_3 \sqrt{27}$.

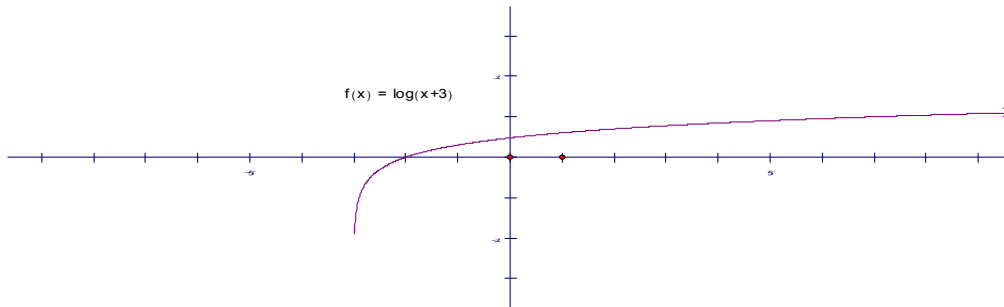
2. Apply Logarithm laws and properties to evaluate logs exactly Example1: $\log_6 12 + \log_6 3$.

Example2: Write as a single logarithm $\log_x 5 + \log_x 6 - \log_x 3$.

3. Evaluate logarithmic expression with bases other than 10. Example: $\log_2 70$.

4. Solve applications of logarithms

5. Given the graph of a function, give it's equation. Example:



6. Graph a logarithmic function given its equation. Example: $2\log(x+5)-6$.

7. Be able to solve exponential problems using logs. Example: The amount of bacterial grows according function. $p(t) = 22(3^{\frac{t}{5}})$, where p is the population is 1000s and t the time in minutes it has been exposed. If the population is 24×10^4 , how long as it been exposed.

8. Understand the restrictions of log.

9. Apply transformations on logarithmic equations. Example: graph $y = \log(2x)$

10. Describe the relationship between logarithms and exponential functions.

11. Convert between logarithmic and exponential form. Example: Convert $\log_3 x = w$ to exponential form, then convert it back to logarithmic form.

Polynomials Equations

1. Solve quadratic equations from factored and standard form.

a) Ex1: Solve $(2x+3)(x-5)=0$

b) Ex2: Solve $3x^2-2x-9$ (put in simplified radical form)

2. Solve third or fourth degree polynomials by using the factor theorem and/or long division. Example: Solve $x^3-6x^2+11x-6=0$

3. Solve third or fourth degree polynomials and state the types of roots given a function in factored form. Example: $f(x) = (2x+1)(x-3)^2(2-x)^3$

Polynomial Functions

1. Know the difference between single, double and triple roots. Be able to give examples of each **algebraically** and **graphically**.

2. Give an function that satisfies the following conditions: Example:

3. Model applications using polynomial functions and solve these functions for answers that make sense in the domain. Example: An amusement park wants to increase their revenue. Currently they charge \$25.00 and 10 000 people, and for every 5 dollar increase, 20 less people come to the park.

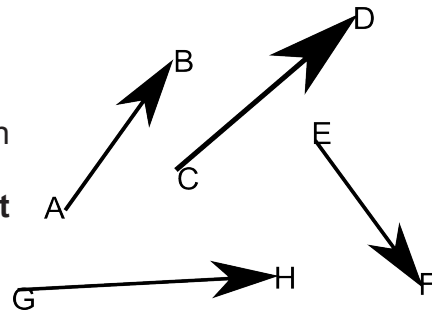
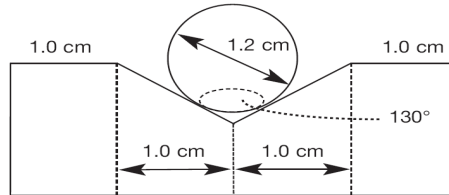
a) Create a function which models the **revenue (total money coming in)** over the

charge.

b) Find the maximum profit. (You may use the TI-NSPIRES)

Geometry

1. Know how to find the circumference of a circle $C = 2\pi r$.
2. Know how to find the area of a circle $A = \pi r^2$.
3. Know how to find the arclength $arclength = \frac{C\theta}{360}$.
4. Know how to find the area of a sector $area = \frac{A\theta}{360}$
5. Know how to find the area of a segment $area = \frac{a\theta}{360} - \frac{bh}{2}$.
6. Know the following properties of circles and how they get applied.
 - a) Tangency segments are equal.
 - b) A tangent to a circle meets a radius at an angle of 90° .
 - c) Two angles that subtend the same angle or chord are equal.
7. Answer questions that involve circle properties. Example: A cylindrical metal rod with a diameter of 1.2 cm is supported by a wooden block, as shown in the following diagram. Determine the distance from the top of the block to the top of the rod.
8. Be able to add/subtract two vectors together with a diagram. Example: Add $AB + CD$ and then subtract $EF - GH$.
9. Know the difference between distance and displacement and how it applies. Example: Position is represent using vectors. Explain why knowing that someone is 69km from Toronto, Ontario, is **not** sufficient to identify that person's exact position.



Measurement

1. Find the volume of complex shapes and answer questions based on the volume. Example: For the small factory shown in the following diagram, design specification require that the air be exchanged every 30 min. Would a ventilation system that exchanges air at a rate of $400 \text{ ft}^3/\text{min}$ satisfy the specifications? Do calculations to justify your response.
2. Know how to convert between metric and imperial measurements and explain your calculations.

