Algebra

- $(a+b)^2 = a^2 + 2ab + b^2$
- $(a-b)^2 = a^2 - 2ab + b^2$
- $(a+b)(a-b) = a^2 - b^2$
- $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$
- $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$
- $(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$
- $(1/a) + (1/b) = (a+b)/(ab)$
- $(a-b)/(b-a) = -1$
- If $(a/b) = (c/d)$, then $(a+b)/b = (c+d)/d$
  - The roots of quadratic equation $ax^2 + bx + c = 0$ are

    $$X = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

    Sum of the roots = -b/a

    Product of the roots = c/a

    Max or Min value occurs at $X = -(b/2a)$

    If $b^2 - 4ac > 0$, then 2 real solutions

    If $b^2 - 4ac = 0$, then 1 real solution

    If $b^2 - 4ac < 0$, then 2 imaginary solutions
  - $\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$
  - $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$
  - In binomial expansion of $(a+b)^n$ will have n+1 terms.
  - The degree of monomial is the sum of the exponents of its variable. For example $X^3Y^2Z^2$ is a 7 degree monomial. a^3 is a 3 degrees of

monomial. The degree of polynomial is the greatest degree of its monomials. For example $(X^3 + Y^2)$ is a 3 degree polynomial.

- A monomial is any constant or any variable OR a product of a constant and a variable. Ex: X or 5 or 5X but NOT X + 5
- A binomial is any equation with two terms
- A trinomial is any equation with three terms
- Equation of any line
  - Ask for a point (x_1, y_1) and slope m, then $(y - y_1) = m(x-x_1)$

- Compound Interest Formula:

$$A = P\{1 + (r/n)\}^{nt}$$

P = Principal or beginning amount, r = interest rate %/100, n = number of times it is compounded, ex: monthly n=12 and daily n=365, t = number of years.

- Continuous compound interest formula:

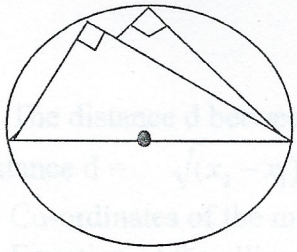
$$A = P*e^{rt}$$

Where e is the natural base and e = 2.718…

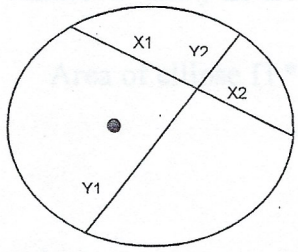
- A union B = A U B = everything in the either of the set A and set B without duplicating.

- A intersection B = A ∩ B =Only those items that are common to set A and B.

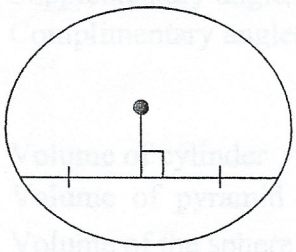
- Number of subsets in a set of 'n' elements = 2^n



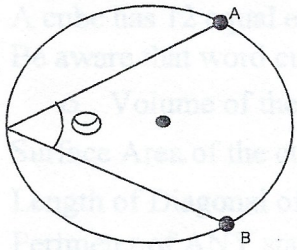
All triangles inside the semi-circle are right triangles.



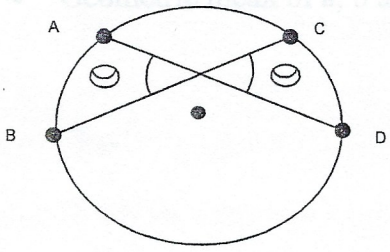
$(X1 \bullet X2) = (Y1 \bullet Y2)$



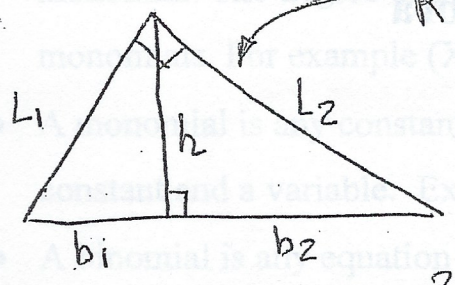
Line from center to chord and perpendicular to chord, bisects the chord.



$\measuredangle = \frac{1}{2} \overset{\frown}{AB}$



$\measuredangle = \frac{1}{2} (\overset{\frown}{AB} + \overset{\frown}{CD})$

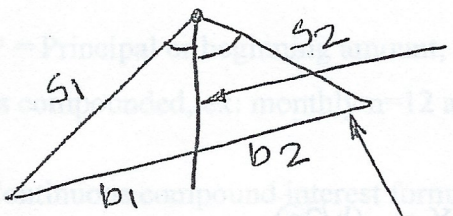


① $\frac{b_1}{h} = \frac{h}{b_2}$ $\therefore h^2 = b_1 \cdot b_2$ $\therefore h = \sqrt{b_1 \cdot b_2}$

② $\frac{b_1}{L_1} = \frac{L_1}{b_1 + b_2}$ $\therefore L_1^2 = b_1 (b_1 + b_2)$

③ $\frac{b_2}{L_2} = \frac{L_2}{b_1 + b_2}$ $\therefore L_2^2 = b_2 (b_1 + b_2)$

④



$\frac{b_1}{b_2} = \frac{s_1}{s_2}$

Not Right Triangle.