x & y intercepts $f(x) = y$ is a function

x-intercept : Substitute $y=0$ and solve for x
(At these values of x, the graph crosses the x-axis)

y-intercept : Put $x=0$, compute y, this is the y-intercept
(At these values of y, the graph intersect the y-axis)

Eg) $f(x) = y = x^2+x-2$

x-intercept : $x^2+x-2=0 \Rightarrow (x+2)(x-1)=0 \Rightarrow x=-2, x=1$
Therefore the graph intercect the x-axis at these points.

y-intercept : Put $x=0$, get $y=-2$
The graph intersects the y-axis at this point

Eg) $f(x) = x^3-33x^2+216x-2$

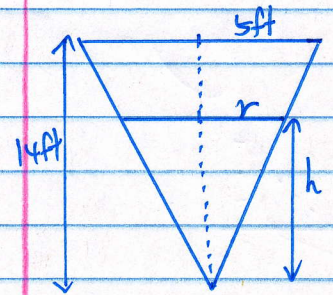
x-intercept : $x^3-33x^2+216x-2=0$, solutions of this equation.

y-intercept : -2

Eg) A tank of water in the shape of a cone is leaking water at a constant rate of $2\,ft^3/hr$. The basic radius of the tank is 5ft and the height is 14ft

a) At what rate is the depth of water changing when the depth is 6ft? $\frac{dh}{dt}$

b) At what rate is the radius of the top of the water changing when the depth is 6ft? $\frac{dr}{dt}$



Given: $\frac{dv}{dt} = -2$ $V = \frac{1}{3}\pi r^2 h$

Asking for $\frac{dh}{dt}$; $\frac{dr}{dt}$ $\frac{dV}{dt} = \frac{2}{3}\pi r \frac{dr}{dt} h + \frac{1}{3}\pi r^2 \frac{dh}{dt}$

$\frac{r}{h} = \frac{5}{14} \Rightarrow r = \frac{5h}{14}$ $= \frac{2}{3}\pi\left(\frac{5h^2}{14}\right)\frac{dr}{dt} + \frac{1}{3}\pi\left(\frac{25h^2}{14\times14}\right)\frac{dh}{dt}$

Substitute this in the formula for V

$V = \frac{1}{3}\pi\left(\frac{5h}{14}\right)^2 \times h$