Formulas:

$y = ax^2 + bx + c$ $\qquad$ $y = a(x-h)^2 + k$

v: $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$ $\qquad$ (h, k)

c: distance from focus to vertex

$a = \frac{1}{4c}$ $\qquad$ $x^2 = a(y-k)^2 + h$

directrix: $y = -c$ $\qquad$ directrix: $x = -c$

focus: $(h, k+c)$ $\qquad$ focus: $(h+c, k)$

factor $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

Series: (low priority)

finite number $\qquad$ infinite number

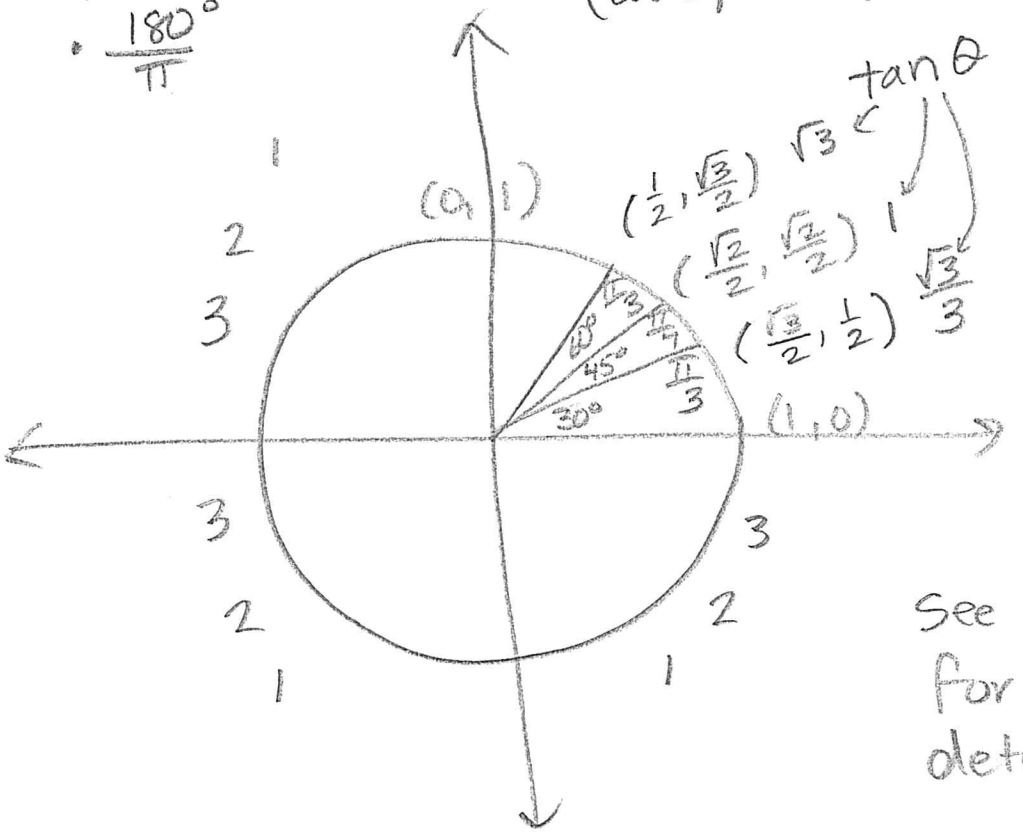
$S_n = \frac{a_1(1-r^n)}{(1-r)}$ $\qquad$ $S_n = \frac{a_1}{1-r}$ $\qquad$ $\sum_{k=1}^{n} a_1 r^{k-1}$

explicit: $a_n = a_1 r^{n-1}$

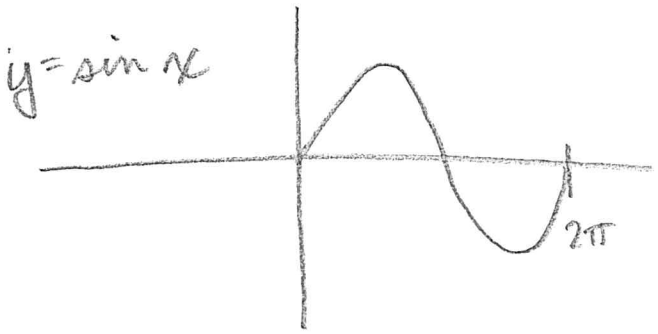
recursive: $a_n = a_{n-1} \cdot r$

Trig: degree to radians $\cdot \frac{\pi}{180^\circ}$

radians to degree $\cdot \frac{180^\circ}{\pi}$



See your copy for more details.

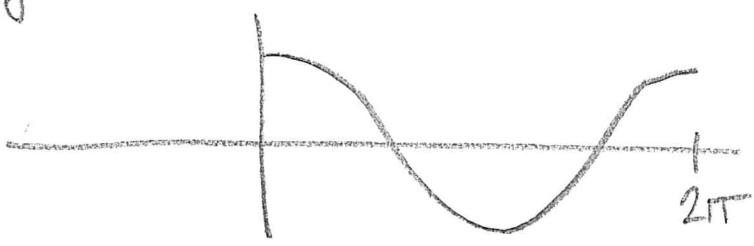


$y = a \sin(bx - h) + k$

amplitude: a

period: $P = \frac{2\pi}{b}$

midline: $y = k$



$y = a \cos(bx - h) + k$

amplitude: a

Period: $P = \frac{2\pi}{b}$

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$x^2 + y^2 = r^2$ Pythagorean Theorem

$\frac{x^2}{r^2} + \frac{y^2}{r^2} = \frac{r^2}{r^2}$ Divide by r^2

$\sin\theta = \frac{y}{r}$

$\cos\theta = \frac{x}{r}$

$\left(\frac{x}{r}\right)^2 + \left(\frac{y}{r}\right)^2 = 1$ Power of a Quotient

$\cos^2\theta + \sin^2\theta = 1$ Substitute

$\cos\theta = \frac{x}{r}$

$\sin\theta = \frac{y}{r}$

Exponential

$y = ab^x$

a ↓ initial value

$b = 1 + r$ growth

$1 - r$ decay

compound interest

$A = P(1+r)^t$ yearly

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

continuously compounded

$A = Pe^{rt}$

Logarithms

$$y = b^x \iff \log_b y = x$$

$$\log_b m + \log_b n = \log_b mn$$

$$\log_b m - \log_b n = \log_b \frac{m}{n}$$

$$n \log_b m = \log_b m^n$$

$\log_e \to \ln$ $\quad$ $\log_{10} = \log$

$$\log_a b = \frac{\log b}{\log a}$$ (on reference sheet)

$$\sqrt[m]{a^n} = a^{\frac{n}{m}}$$

Perpendicular lines: slopes are opposite reciprocals

Parallel lines: same slopes

$y - y_1 = m(x - x_1)$ $\quad$ $y = mx + b$ $\quad$ $Ax + By = C$

$$f(x)=\frac{9x^2-4}{3x^2-13x-10}=\frac{(3x+2)(3x-2)}{(3x+2)(x-5)}$$

V.A. $x=5$

Hole $x=-\frac{2}{3}$

H.A. $y=\frac{9}{3}$

$\boxed{y=3}$

H.A.

degree $\frac{m}{n}$ $\begin{cases} m>n & \text{none} \\ m=n & y=\frac{a}{b} \text{ (coefficients)} \\ m<n & y=0 \end{cases}$

x-int (where $y=0$) $9x^2-4=0$

$9x^2=4$

$x^2=\frac{4}{9}$

$x=\pm\frac{2}{3}$

(neg. is hole)

$x=\frac{2}{3}$

$\left(\frac{2}{3},0\right)$

y-int (where $x=0$) $f(0)=\frac{9\cdot0^2-4}{3\cdot0^2-13\cdot0-10}$

$=\frac{-4}{-10}=\boxed{\frac{2}{5}}$

$y=\frac{2}{5}$

$\left(0,\frac{2}{5}\right)$

ME: $1.96\cdot\frac{\sigma}{\sqrt{n}}$

Marginal error

$\sigma=\sqrt{\frac{(x-\mu)^2}{n}}$