TSC | WILLIAM D. LAW, JR. LEARNING COMMONS

MAC 1105 Formulas

Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Slope-intercept form	$y = mx + b$,
Point-slope form	$y - y_1 = m(x - x_1)$ or $y = m(x - x_1) + y_1$
Slope of parallel lines	$m_1 = m_2$
Slope of perpendicular lines	$m_2 = \frac{-1}{m_1}$ or opposite reciprocal
Special lines	y = b; horizontal line, x = a; vertical line
Quadratic formula	Given $ax^2+bx+c=0$; $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Vertex (max or min)	$\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$
x-intercept	Let y = 0; (a, 0)
y-intercept	Let x = 0; (0, b)

Money and Depreciation

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

$A = Pe^{rt}$, use when continuous

$V = a(b)^{t;} b = 1 \pm r$

Double time $= \frac{\ln(2)}{r}$

half-life $= \frac{\ln(.5)}{r}$

Solving Absolute Value Equations

$|a+b| > c \rightarrow (a+b) > c$ **or** $(a+b) < -c$

$|a+b| < c \rightarrow (a + b) < c$ **and** $(a+b) > -c$ or

$|a+b| < c \rightarrow -c < (a + b) < c$

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Translation rules

y = f(x + a)	a units to the left
y = f(x – a)	a units to the right
y = f(x) + a	a units up
y= f(x) – a	a units down
y = -f(x)	Reflected over the x axis
y = f(-x)	Reflected over the y axis
Is f(x)= f(-x)	Symmetric to the y axis
Is f(x) = -f(x)	Symmetric to the x axis
Is f(x) = -f(-x)	Symmetric to the origin
y = cf(x)	c > 1: stretch vertically, 0< c <1: compress vertically

Logarithm rules

$log_a mn = log_a m + log_a n$
$log_a \frac{m}{n} = log_a m - log_a n$
$log_a m^p = p\ log_a m$
$log_a x = y \leftrightarrow a^y = x$
$log_a m = \frac{log\ m}{log\ a} = \frac{\ln m}{\ln a}$
$\ln e^x = x\ and\ \ e^{\ln x} = x$
$log_a a^x = x$ and $a^{log_a x} = x$
$if\ a^x = a^y;\ a \neq 0, then\ x = y$
$log_a m = log_a n; m, n > 0, then\ m = n$
$log_a a = 1\ and\ ln_e e = 1\ and\ log_a 1 = 0$

Exponent Rules

$m^a m^b = m^{a+b}$	$(m^a)^b = m^{ab}$
$\frac{m^a}{m^b} = m^{a-b}$	$m^{-a} = \frac{1}{m^a}$
$m^0 = 1$	$\sqrt[b]{m^a} = m^{\frac{a}{b}}$
n even, $\sqrt[n]{a^n} = \lvert a \rvert$	n odd, $\sqrt[n]{a^n} = a$
$i = \sqrt{-1}, i^2 = -1$	$\sqrt{-m} = i\sqrt{m}$

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