MAC 1105 Formulas

Slope of a line	$m = \dfrac{y_2 - y_1}{x_2 - x_1}$
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	$m_2 = \dfrac{-1}{m_1}$ or opposite reciprocal
Special lines	$y = b$; horizontal line, $x = a$; vertical line
Quadratic formula	Given $ax^2 + bx + c = 0$; $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Vertex (max or min)	$\left(\dfrac{-b}{2a}, f\left(\dfrac{b}{2a} \right) \right)$
Equation of a circle	$r^2 = (x - h)^2 + (y - k)^2$ R(radius) center(h,k)
Distance	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
midpoint	$\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2} \right)$
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

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

Solving Absolute Value Equations

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

Logarithm rules

$log_a mn = log_a m + log_a n$
$log_a \dfrac{m}{n} = log_a m - log_a n$
$log_a m^p = p \, log_a m$
$log_a x = y \leftrightarrow a^y = x$
$log_a m = \dfrac{log\,m}{log\,a} = \dfrac{\ln m}{\ln a}$
$\ln e^x = x$ 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 $\ln_e e = 1$

Exponent Rules

$m^a m^b = m^{a+b}$	$(m^a)^b = m^{ab}$
$\dfrac{m^a}{m^b} = m^{a-b}$	$m^{-a} = \dfrac{1}{m^a}$

|a+b|> c ❼ (a+b) > c or (a+b) < -c
|a+b| < c ❼ (a + b)< c and (a +b) > -c or
|a+b| < c ❼ -c < (a + b) < c

m_b	
$m^0 = 1$	$\sqrt[b]{m^a} = m^{\frac{a}{b}}$
n even, $\sqrt[n]{a^n}= |a|$	n odd, $\sqrt[n]{a^n}= a$
$i = \sqrt{-1},\ i^2 = -1$	$\sqrt{-m} = i\sqrt{m}$