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CC ALGEBRA 2

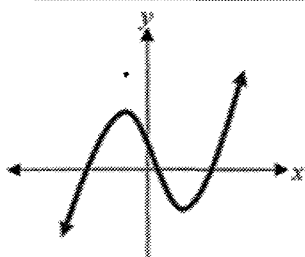
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## ALGEBRA 2 FORMULAS TO MEMORIZE

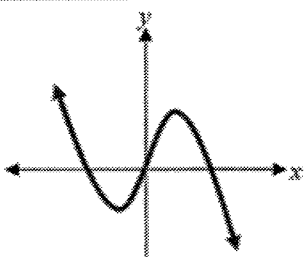
### DIRECTIONS: FILL IN ALL MISSING INFORMATION:

- "DOCS": Factor Difference of Two Cubes:  $(x-a)(x^2+ax+a^2)$  "S.O.A.P"  
ex)  $(x^3-8) = (x-2)(x^2+2x+4)$   
a p p i w a y s o s i t i v e
- "SOCS": Factor Sum of Two Cubes:  $(x+a)(x^2-ax+a^2)$  "S.O.A.P"  
ex)  $(x^3+64) = (x+4)(x^2-4x+16)$

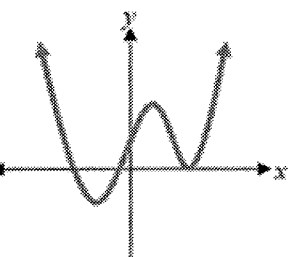
### End Behaviours and Leading Terms



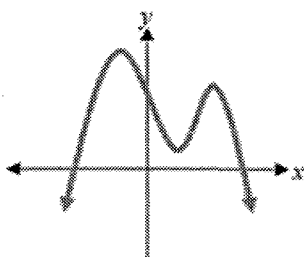
Polynomial Function  
and Positive Leading  
Coefficient,  $a > 0$



Polynomial Function  
and Negative Leading  
Coefficient,  $a < 0$



Polynomial Function  
and Positive Leading  
Coefficient,  $a > 0$



Polynomial Function  
and Negative Leading  
Coefficient,  $a < 0$

- ODD DEGREE      ODD DEGREE      EVEN DEGREE      EVEN DEGREE

- An **EVEN FUNCTION** has the following properties:

➤ symmetric about the y-axis.

➤  $f(-x) = f(x)$

- An **ODD FUNCTION** has the following properties:

➤ symmetric about the origin.

➤  $f(-x) = -f(x)$

- EQUATION OF PARABOLA when given focus, directrix and vertex:

$$(y - k) = \frac{1}{2p} (x - h)^2$$

where  $p$  is the distance from focus to directrix and  $(h, k)$  is the vertex.

- DISCRIMINANT FORMULA:  $b^2 - 4ac$

If the value of the discriminant is:	The roots of the quadratic equation are:
$b^2 - 4ac = \text{perfect square}$	Real, <u>rational</u> , and unequal
non perfect square	Real, <u>irrational</u> , and unequal
Zero!	Real, rational, and <u>equal</u>
A negative #	<u>Imaginary</u>

- $\tan \theta = \frac{\sin \theta}{\cos \theta}$      $\sec \theta = \frac{1}{\cos \theta}$      $\csc \theta = \frac{1}{\sin \theta}$      $\cot \theta = \frac{\cos \theta}{\sin \theta}$  or  $\frac{1}{\tan \theta}$

- CONVERT FROM RADIANS TO DEGREES: Multiply by  $\frac{180}{\pi}$

- CONVERT FROM DEGREES TO RADIANS: Multiply by  $\frac{\pi}{180}$   
DR POT!

- $x^r = \sqrt[r]{x^p}$     \*  $\frac{\text{"power"}}{\text{"rangers" (root)}}$

- PERIOD =  $\frac{2\pi}{b}$

$$y = A \sin(B(x - C)) + D$$

$$|A| = \text{Amplitude}$$

$$B = \text{Frequency}$$

$$C = \text{Phase Shift (left or right)}$$

$$D = \text{Vertical Shift (up or down)}$$

• **TRANSFORMATION RULES**

1. <u>Reflection Rules for <math>f(x)</math> graph</u>	2. <u>Translation Rules for <math>f(x)</math> graph</u>	3. <u>Dilation Rules for <math>f(x)</math> graph</u>
a) $-f(x)$ : reflect X-axis  b) $f(-x)$ : reflect y-axis	a) $f(x) + k$ : up k units  b) $f(x) - k$ : down k units  c) $f(x + h)$ : Left k units  d) $f(x - h)$ : right k units	a) $af(x)$ when $a > 1$ : stretched vertically  b) $af(x)$ when $0 < a < 1$ : compressed horizontally

**SIMPLE INTEREST**

$$A = P(1 \pm r)^t$$

**COMPOUND INTEREST**

$$A = P \left( 1 \pm \frac{r}{n} \right)^{nt}$$

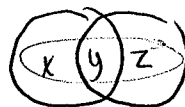
**COMPOUNDED CONTINUOUSLY**

$$A = Pe^{rt}$$

- **AVERAGE RATE OF CHANGE "AROC"**:  $\frac{F(b) - F(a)}{b - a}$

"or"

- $\frac{P(A \cup B)}{\text{★ THINK Venn diagram! ★}} = P(A) + P(B) - P(A \cap B)$



$$P(A \cup B) = x + y + z$$

- Two events are **INDEPENDENT** if  $P(A \cap B) = \frac{P(A) \cdot P(B)}{\text{"and"}}$

- Two events are **INDEPENDENT** if  $P(A|B) = \frac{P(A)}{\text{given}}$  or  $P(B|A) = \frac{P(B)}{\text{given}}$

- **MARGIN OF ERROR** =  $2 \times \text{S.D.}$

- **95% CONFIDENCE INTERVAL** =  $2 \text{ S.D.'s from } \bar{x}$

- 68%: the percent that contains 1 standard deviation away from the mean

- 95%: the percent that contains 2 standard deviations away from the mean

