

SAT  
formulas & properties  
to remember

- distance formula

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

- midpoint formula

$$mp = \left( \frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2} \right)$$

- slope formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

- quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- trig functions: SOHCAHTOA

$$\sin = \frac{O}{H} \quad \cos = \frac{A}{H} \quad \tan = \frac{O}{A}$$

- logarithms

$$\text{if } \log_a b = c, \text{ then } b = a^c$$

## ■ arithmetic sequence

[to find a specific term in a sequence:]

$$a_n = a_1 + (n-1)d$$

\*  $n$  = # of the term you're looking for

\*  $a_1$  = first term in the sequence

\*  $d$  = difference between each term in the sequence

[to find the sum of the sequence:]

$$S_n = \frac{n}{2} (a_1 + a_n)$$

\*  $n$  = # of terms in the sequence

\*  $a_1$  = first term in the sequence

\*  $a_n$  = last term in the sequence

## ■ exponential growth & decline

growth:  $y = a(1+r)^x$

decline:  $y = a(1-r)^x$

\*  $a$  = initial amount

\*  $r$  = rate of growth or decline

\*  $x$  = # of time intervals that have passed



## ■ transformations of common graphs

\* linear  $\longrightarrow y = mx + b$

- $b =$  y-intercept (moves the line up or down)
- $m =$  slope (determines how steep the line is)

\* quadratic (parabolas)

① vertex form  $\longrightarrow y = a(x-h) + k$

- the sign of  $a$  (+ or -) tells us if it is facing up (  $\cup$  ) or down (  $\cap$  )
- $(h, k)$  is the vertex (center) of the parabola
- $h$  moves the parabola left & right
- $k$  moves the parabola up & down

② standard form  $\longrightarrow ax^2 + bx + c$

- $a$  is the same as above  $\uparrow$
- $b$  moves the parabola left & right.  
same sign as  $a \longrightarrow$  moves left  
different sign than  $a \longrightarrow$  moves right
- $c$  is the y-intercept (moves it up & down)

\* circles  $\longrightarrow (x-h)^2 + (y-k)^2 = r^2$

- $(h, k)$  is the center point
- $r$  is the radius