Geometry EOC FSA Mathematics Reference Sheet

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

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

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

Partitioning $\rightarrow$ $x_p = x_1 + k(x_2-x_1)$, $y_p = y_1 + k(y_2-y_1)$

$180(n-2) =$ sum Int. $\angle$'s

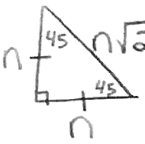
$360 =$ sum Ext. $\angle$'s

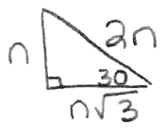
Density $= \frac{\text{Mass}}{\text{Volume}}$

Pop. Density $= \frac{\text{Pop.}}{\text{Land Area}}$

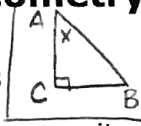
$\frac{\text{BTUs}}{\text{Volume}}$

Special Rights





Formulas



$\sin A = \cos B$

$\sin x = \cos(90-x)$

$\sin A° = \frac{\text{opposite}}{\text{hypotenuse}}$

$\cos A° = \frac{\text{adjacent}}{\text{hypotenuse}}$

$\tan A° = \frac{\text{opposite}}{\text{adjacent}}$

B is "B" = means area of the BASE SHAPE

Area Formulas

$A = \pi r^2$

$C = \pi d$ or $2\pi r$

$A = l \cdot w$

$A = b \cdot h$

Any regular polygon: $A = \frac{1}{2}ap$

Kite, rhombus, square: $A = \frac{d_1 \cdot d_2}{2}$

$A = \frac{bh}{2}$

$A = \frac{h(b_1+b_2)}{2}$

Volume & Surface Area

$V = \pi r^2 h$

$LA = 2\pi rh$

$SA = 2\pi rh + 2\pi r^2$

$V = \frac{1}{3}\pi r^2 h$

$LA = \pi rl$

$SA = \pi rl + \pi r^2$

Prisms, Pyramids: SA — find area of each side and add them together

$V = Bh$

$V = \frac{1}{3}Bh$ if it has a point

$V = \frac{4}{3}\pi r^3$

$SA = 4\pi r^2$

Prove Similar

$\triangle a \sim \triangle b$

AA~, SSS~, SAS~ only

Scale factor $a:b$ sides, perimeter

$a^2:b^2$ area

$a^3:b^3$ volume

Proofs

$\triangle \cong \triangle$ SAS, ASA, SSS, AAS, HL

once $\cong$, you can use CPCTC to show the corresponding parts are also congruent

$y = mx + b$, where m = slope and b = y-intercept

$y - y_1 = m(x - x_1)$, where m = slope and (x_1, y_1) is a point on the line

Circles

$(x-h)^2 + (y-k)^2 = r^2$

$\frac{x}{360} \cdot \pi r^2 =$ sector area

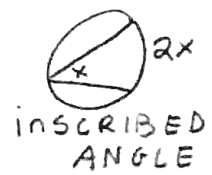
$\frac{x}{360} \cdot 2\pi r =$ Arc Length

$a \cdot b = x \cdot y$

$x° = \frac{\text{Arc 1} + \text{Arc 2}}{2}$

$x° = \frac{\text{far} - \text{near}}{2}$

Ext (whole) = ext (whole)



$x + y = 180$

$a + b = 180$

inscribed quadrilateral

Degrees ↔ Radians

Degrees $\cdot \frac{\pi}{180} =$ Radians

Radians $\cdot \frac{180}{\pi} =$ Degrees

Transformations

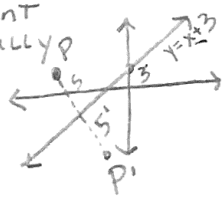
Translation $(x, y) \rightarrow (x+a, y+b)$

Reflection

$y = x$ $(x, y) \rightarrow (y, x)$

$y = -x$ $(x, y) \rightarrow (-y, -x)$

Reflection in $y = |x+b|$, you need to count diagonally?



Rotation

+ counterclockwise

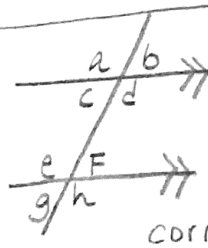
− clockwise

Dilation (centered at (0,0))

$(x, y) \rightarrow (kx, ky)$

$k = \frac{\text{new}}{\text{old}}$

- only non-rigid transformation
- side length are not $\cong$ before and after
- if not centered at (0,0), you use slope method



$a = a$

$0 = 0$

$a + 0 = 180$

alt. int = c & f, d & e

SSI = d & f, c & e

corresponding = a & e, b & f, c & g, d & h

$\angle$'s