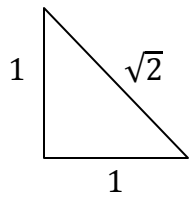
Algebra Formulas:

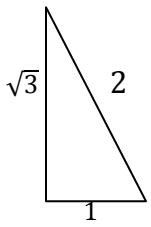
1. $a^3 - b^3 = (a-b)(a^2+ab+b^2)$
2. $a^3 + b^3 = (a+b)(a^2-ab+b^2)$
3. Complex conjugate for $a+bi$ is $a-bi$
4. $\sqrt{-1} = i$ or $i^2 = -1$
5. Vertex of a parabola is: $x = \frac{-b}{2a}$
6. General form of quadratic equation is:
   $ax^2 + bx + c = 0$
7. Quadratic formula: $x_{1,2} = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
8. Discriminant: $D = b^2 - 4ac$
9. $x = b^y \leftrightarrow y = log_b x$
10. The Laws of Logarithms
    1. $log_b M \cdot N = log_b M + log_b N$
    2. $log_b \frac{M}{N} = log_b M - log_b N$
    3. $log_b a = \frac{log_c a}{log_c b}$
    4. $log_b b = 1$ or $b^{log_b x} = x$
    5. $log_b 1 = 0$
11. $y = A(1 + \frac{r}{n})^{nt}$; compound interest formula
12. $y = A(b)^{t/d}$; growth or decay formula
13. Conic sections:
    $Ax^2 + By^2 + Cx + Dy + E$
    Parabola: only has 1 squared variable.
    Circle: A=B, both (+)
    Ellipse: A≠ B, both (+)
    Hyperbola: A or B is (−)
    Asymptotes: y $= m \cdot x \rightarrow y = \frac{\sqrt{\#\ under\ y}}{\sqrt{\#\ under\ x}} \cdot$ x
14. The number needs to add to both sides to Complete the Square: $(\frac{b}{2a})^2$
15. Fundamental Counting Principle = ☐ ☐ = m · n
16. $|ax+b| = c \Rightarrow\ ax+b = -c$ or $|ax+b| = c$
    Graph: ⟷
17. $|ax+b| > c \Rightarrow\ ax+b < -c$ or $|ax+b| > c$
    Graph: ⟷
18. $|ax+b| < c \Rightarrow\ -c < ax+b < -c$
    Graph: ⟷
19. Probability
    1. $P(E) = \frac{\#\ of\ element}{\#\ of\ sample\ space}$
    2. $P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B)$
    3. $P = P(A) \cdot P(B)$ Independent (take something from the bag and put it back).
    4. $P(A\ and\ B) = P(A) \times P(B|A)$ Dependent (take something but did **NOT** put it back).

    Note: P(B|A) is read "probability of event B, given event A occurs.
20. Infinite Geometric Series $|r| < 1$
    $S_\infty = \frac{a_1}{1-r}$
21. $\bar{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$
    $\bar{x}$ −mean
    x −each value
    n −# of values
22. Variance $= \frac{(x_1-\bar{x})^2 + (x_2-\bar{x})^2 + \cdots + (x_n-\bar{x})^2}{n}$
23. σ =standard deviation $= \sqrt{variance}$

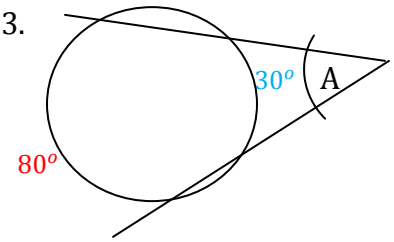
Geometry Formulas:

1. 

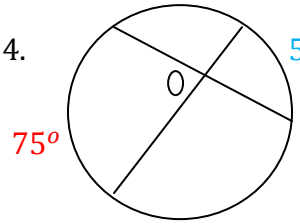
$45^o - 45^o - 90^o$

2. 

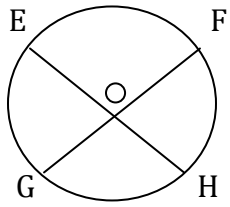
$30^o - 60^o - 90^o$

3. 

$A = \frac{(80-30)}{2}$

4. 

Angle O $= \frac{(75+50)}{2}$

5. 

$EO \cdot OH = GO \cdot OF$

6. Sin $= \frac{opposite}{hypotenuse}$

   Cos $= \frac{adjacent}{hypotenuse}$

   Tan $= \frac{opposite}{adjacent}$

7. Trapezoid: Area= (the sum of || sides)$\cdot \frac{h}{2}$
8. Parallelogram: opposite sides are || and ≅

   Area $= b \cdot h$
9. Rhombus: all sides are ≅, $\perp$ diagonals.
10. Surface of area of geo. shape

    = add up all areas of the sides.
11. Volume of geo. shape

    = A of the base * h.
12. Volume of geo. shape w/ a peak

    $= \frac{1}{3} \cdot area\ of\ base \cdot h$