

## Formula Sheet for Intermediate Algebra Final Exam

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| <p><u>Properties of Exponents</u></p> <ol style="list-style-type: none"> <li><math>a^n a^m = a^{n+m}</math></li> <li><math>\frac{a^n}{a^m} = a^{n-m}</math></li> <li><math>(a^n)^m = a^{nm}</math></li> <li><math>(a^n b^m)^p = a^{np} b^{mp}</math></li> <li><math>\left(\frac{a^n}{b^m}\right)^p = \frac{a^{np}}{b^{mp}}</math></li> <li><math>b^{-p} = \frac{1}{b^p}</math></li> </ol> | <p><u>Quadratic Formula</u></p> $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ <p><u>Vertex of Parabola</u></p> $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$ $f(x) = a(x-h)^2 + k$ <p>Vertex at <math>(h, k)</math></p>         | <p><u>Interest Formulas</u></p> <p><i>compound</i></p> $A = P\left(1 + \frac{r}{n}\right)^{nt}$ <p><i>continuous</i></p> $A = Pe^{rt}$ <p><u>Pythagorean Theorem</u></p> $a^2 + b^2 = c^2$ <p><u>Midpoint Formula</u></p> $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ |
| <p><u>Properties of Radicals</u></p> <ol style="list-style-type: none"> <li><math>(\sqrt[n]{b})^m = \sqrt[n]{b^m} = b^{\frac{m}{n}}</math></li> <li><math>\sqrt[n]{a}\sqrt[n]{b} = \sqrt[n]{ab}</math></li> <li><math>\sqrt[m]{\sqrt[n]{b}} = \sqrt[mn]{b}</math></li> <li><math>\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}, b \neq 0</math></li> </ol>                      | <p><u>Absolute Value Inequalities</u></p> $ E  \leq k \text{ iff } -k \leq E \leq k$ $ E  \geq k \text{ iff}$ $E \leq -k \text{ or } E \geq k$ <p><u>Absolute Value Equations</u></p> $ E  = k$ $\text{iff } E = k \text{ or } E = -k$ | <p><u>Distance Formula</u></p> $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ <p><u>Equations for Graphing Lines</u></p> $m = \frac{y_2 - y_1}{x_2 - x_1}, y = mx + b$ $y - y_1 = m(x - x_1)$   |
| <p><u>Factoring the Sum of Two Cubes</u></p> $a^3 + b^3$ $= (a + b)(a^2 - ab + b^2)$  | <p><u>Factoring the Difference of Two Cubes</u></p> $a^3 - b^3$ $= (a - b)(a^2 + ab + b^2)$  | <p><u>Factoring Perfect Square Trinomials</u></p> $a^2 + 2ab + b^2 = (a + b)^2$ $a^2 - 2ab + b^2 = (a - b)^2$   |
| <p><u>Formula for Variation</u></p> <p>Direct Variation: <math>y = kx</math></p> <p>Inverse Variation: <math>y = k/x</math></p> <p>Joint Variation: <math>y = kxz</math></p> <p>Combo Variation: Mix of Above</p>   |  |   |