TMTH 104
Midterm Exam Formula Sheet

Chapter 1: Numerical Computation

Distance $=$ Rate $\times$ Time

Amount $=$ Rate $\times$ Base (where Rate is in its decimal form)

Percent change $= \dfrac{(\text{new value} - \text{original value})}{\text{original value}} \times 100$

Percent efficiency $= \dfrac{\text{output}}{\text{input}} \times 100$

Percent error $= \dfrac{(\text{measured value} - \text{known value})}{\text{known value}} \times 100$

Percent concentration of ingredient A $= \dfrac{\text{amount of A}}{\text{total amount of mixture}} \times 100$

Chapter 2: Algebra

$(a \pm b)^2 = a^2 \pm 2ab + b^2$ $\qquad\qquad a^2 - b^2 = (a - b)(a + b)$

Given nonzero real numbers x and y, and integers m and :

$x^1 = x$ $\qquad\qquad x^0 = 1$ $\qquad\qquad x^{-n} = \dfrac{1}{x^n}$

$(x^m)^n = x^{m \cdot n}$ $\qquad\qquad x^m \cdot x^n = x^{m+n}$ $\qquad\qquad \dfrac{x^m}{x^n} = x^{m-n}$

$(xy)^n = x^n y^n$ $\qquad\qquad \left(\dfrac{x}{y}\right)^n = \dfrac{x^n}{y^n}$ $\qquad\qquad \left(\dfrac{x}{y}\right)^{-n} = \left(\dfrac{y}{x}\right)^n$

Chapter 5: Graphs

slope $m = \dfrac{\text{rise}}{\text{run}} = \dfrac{y_2 - y_1}{x_2 - x_1},$ $\qquad$ y-intercept $= b$

Equation of line in slope-intercept form: $y = mx + b$

Chapter 8: Factoring $(a \pm b)^2 = a^2 \pm 2ab + b^2$ $a^2 - b^2 = (a - b)(a + b)$

Chapter 9: Fractions $\dfrac{a}{b} \cdot \dfrac{c}{d} = \dfrac{ac}{bd}$ $\dfrac{a}{b} \div \dfrac{c}{d} = \dfrac{a}{b} \cdot \dfrac{d}{c} = \dfrac{ad}{bc}$

Chapter 19: Ratio, Proportion, and Variation

Direct Variation: $y = kx$ or $\dfrac{y_2}{y_1} = \dfrac{x_2}{x_1}$

Power Variation: $y = kx^n$ or $\dfrac{y_2}{y_1} = \dfrac{(x_2)^n}{(x_1)^n}$

Inverse Variation: $y = \dfrac{k}{x}$ or $\dfrac{y_2}{y_1} = \dfrac{x_1}{x_2}$

Joint Variation: $y = kxw$