

Useful Fact Sheet Module 1 – Alg.Trig. I

Interval, Set Builder Notation

$$(a,b) = \{x | a < x < b\}$$

$$[a,b) = \{x | a \leq x < b\}$$

$$(a,b] = \{x | a < x \leq b\}$$

$$[a,b] = \{x | a \leq x \leq b\}$$

$$(-\infty, a) = \{x | x < a\}$$

$$[a, \infty) = \{x | x \geq a\}$$

Rational Exponents

$$\sqrt[n]{a} = a^{\frac{1}{n}}$$

Slope Formula

$$\text{Slope } (m) = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{General Form: } Ax + By + C = 0$$

X-Intercept: Let $y=0$

Y-Intercept: Let $x=0$

Horizontal Line: $y=\#$

Vertical Line: $x=\#$

Parallel lines: $m_1 = m_2$

Perpendicular: $m_1 = \frac{-1}{m_2}$

Slope Intercept: $y = mx + b$

Point Slope Form: $y - y_1 = m(x - x_1)$

Domain: Set of all x, first coordinate, independent variable, input values

Range: Set of all y, second coordinate, dependent variable, output values

The **composition function:** $(f \circ g)(x) = f(g(x))$, x is in the domain of g and g(x) is in the domain of f.

Symmetric w/ Respect to y-axis: for every point (x,y) on the graph, the point (-x,y) is also on the graph.

Symmetric w/ respect to x-axis: for every point (x,y) on the graph, the point (x,-y) is also on the graph.

Symmetric w/ respect to origin: if for every point (x,y) on the graph, the point (-x,-y) is also on the graph

Even –symmetric with respect to the y-axis. $f(x) = f(-x)$

Odd –symmetric with respect to the origin. $f(-x) = -f(x)$

Difference quotient or average rate of change $\frac{f(x+h)-f(x)}{h}$

The **average rate of change** of f from x_1 to x_2 $\frac{\Delta y}{\Delta x} = \frac{f(x_2)-f(x_1)}{x_2-x_1}$

The **average velocity** of the object from t_1 to t_2 is $\frac{\Delta s}{\Delta t} = \frac{s(t_2)-s(t_1)}{t_2-t_1}$

Algebra of Functions:

$$(f + g)(x) = f(x) + g(x)$$

$$(f \times g)(x) = f(x) \times g(x)$$

$$(f - g)(x) = f(x) - g(x)$$

$$(f \div g)(x) = f(x) \div g(x); \text{ provided } g(x) \neq 0$$

Definition of the Inverse function: $f(f^{-1}(x)) = x$ and for every x in the domain of f^{-1} and $f^{-1}(f(x)) = x$ for every x in the domain of f

Obtaining an inverse relation: we interchange the first and second coordinates the relation obtained is an inverse of the relation

Obtaining a formula for an inverse:

Step 1: Replace f(x) with y

Step 3: Solve for y

Step 2: Interchange x and y

Step 4: Replace y with f(x)

