

**STUDY GUIDE FOR THE
MATH ADVISING TOOL (MAT)
MATH 1405 – CALCULUS AND ANALYTICAL GEOMETRY 1**

1. Simplifying radicals
2. Adding/Subtracting/Multiplying/Dividing fractions containing variables
3. Order of Operations
4. Logarithms
5. Functions
6. Fractional exponents
7. Solving for an unknown term in equations and inequalities (for example:
linear, literal, quadratic, radical, fractional)
8. Absolute value
9. Reading graphs of common equations and inequalities (for example: circles
parabola, lines, systems, etc.)
10. Checking possible solutions for given equations
11. Solving inequalities
12. Factoring
13. Trigonometry

Sample problems to study for AA

Simplifying Radicals

If $x > 0$, then $\sqrt{144x^2 - 16x^2} =$

If $x > 0$, then $\sqrt{25x^4 - 4x^2} =$

If $x > 0$ and $y > 0$, then $\sqrt{100y^2 - 49x^6} =$

Adding/Subtracting/Multiplying/Dividing fractions containing variables
(□ means try each)

$$\frac{x+4}{2x+2} \square \frac{2(x^2-1)}{x^2-16} =$$

$$\frac{x}{4y} + \frac{3x}{3y} =$$

$$\frac{x-2}{x^2-4} \square \frac{x^2+4x+4}{x+2} =$$

Order of Operations

$$-3 - (2 - 5) + 6 - (7 - 6) =$$

$$\text{If } x = \frac{3}{2}, \text{ then } \frac{3}{x} + x - 4 =$$

$$\text{If } y = 3, \text{ then } 2y - (1 - y) + y =$$

Logarithms

$$\text{If } \log_{10} x = 3 \text{ then } x =$$

$$\log_2(32) =$$

$$\text{If } 3^w = 15, \text{ then } w =$$

Functions

$$\text{If } f(x) = x^2 + 3 \text{ and } g(x) = 2x - 2, \text{ then } f(g(3)) =$$

$$\text{If } f(x) = x^2 + kx + 9 \text{ and } f(2) = 21, \text{ then } k =$$

$$\text{If } f(x) = 6x - 4 \text{ and } g(x) = x^2 - 3, \text{ then } g(f(3)) =$$

Fractional Exponents

$$(4)^{3/2} (125)^{1/3} =$$

$$(8)^{1/3} (16)^{1/2} =$$

$$(27)^{1/3}(8)^{2/3} =$$

Solving for an unknown term in equations and inequalities
(linear, literal, quadratic, radical, fractional)

$$\text{If } 2 + \frac{x}{4} = \frac{8}{5}, \text{ then } x =$$

$$\text{If, for all values of } x, (x+k)^2 = k^2 + 8x + x^2, \text{ then } x =$$

$$\text{If } a \neq b, \text{ and } b(a+x) = ca+x, \text{ then } x =$$

Absolute Value

$$\text{If } x > 4, \text{ then } |4-x| =, >, < \text{ ______}$$

$$|3-(5-1)| =$$

Reading graphs of common equations and inequalities
(circles, parabolas, lines, systems, etc.)

Check possible solutions for given equations

Solve Inequalities

$$x^2 - 7x < 10 \text{ has what solution?}$$

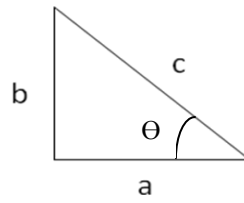
$$\text{example: } a < x < b$$

Factor and Reduce

$$\frac{x^2 - 16}{x + 4} =$$

$$\frac{x^3 + 27}{x + 3} =$$

Trigonometry



$$\sin \theta =$$

$$\tan \theta =$$

$$\frac{1}{\cos \theta} =$$

$$\sin^2 \theta + \cos^2 \theta =$$

$$\cos 2\theta =$$

$$\sin 2\theta =$$