MATHEMATICS GUIDED SELF PLACEMENT PROCESS
Course Description

<table>
<thead>
<tr>
<th>COURSE NAME</th>
<th>MATH 45 – BEGINNING ALGEBRA</th>
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</thead>
<tbody>
<tr>
<td>Number of Units and Grading Options</td>
<td>4 units Pass/No Pass or Grade is Allowed</td>
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<tr>
<td>Catalog Description</td>
<td>Emphasizes elementary concepts of algebra, including real numbers, linear equations and inequalities in one variable, graphs of lines and inequalities in two variables, Pythagorean theorem, 2x2 systems, exponents, polynomials, factoring techniques, rational expressions, and applications. (Not open to students with credit in MATH 48).</td>
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<tr>
<td>Degree Applicability</td>
<td>No</td>
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<td>Co-requisite Support Available?</td>
<td>No</td>
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<td>Additional Information</td>
<td>Beginning Algebra is a course option for either students who have previously taken algebra and need a refresher course, or for students who need to learn algebra in order to learn the requisite skills needed for intermediate algebra so that may meet the educational goals for their intended major.</td>
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Helpful Background Knowledge:
To be successful in Beginning Algebra, students should have a solid grounding in the four fundamental arithmetic skills -- addition, subtraction, multiplication and division, as well as ability to work with types of numbers such as: integers, fractions, decimals, percents, and negative numbers. If it has been several years since your last Algebra course, you may need to utilize college resources to learn/recall algebra concepts necessary to understand the core content of this course.

Typical material covered in Beginning Algebra is:

1. Evaluating expressions. Find the value of: $-x^2 + 3x - 1$ when $x = -3$

$$x = -3$$

$$- (-3)^2 + 3(-3) - 1$$

$$-9 + 3(-3) - 1$$

$$-9 - 9 - 1$$

$$-18 - 1 = -19$$
2. **Solving linear equations.** Solve: \(3(4y + 1) - 4 = -13\)

\[
\begin{align*}
3(4y + 1) & - 4 = -13 \\
12y + 3 - 4 & = -13 \\
12y - 1 & = -13 \\
12y - 1 + 1 & = -13 + 1 \\
12y & = -12 \\
\frac{12y}{12} & = \frac{-12}{12} \\
y & = -1 \\
\checkmark
\end{align*}
\]

3. **Solving word problems.** EZ Rider Truck Rental charges $50 per day plus $0.25 per mile to rent a small truck. Trucks-R-Us charges $35 per day plus $0.30 per mile for the same model truck. For how many miles will the daily costs of renting the two trucks be the same?

\[
\begin{align*}
&x = \text{Number of miles driven} \\
&0.25x + 50 = \text{EZ Rider Truck Rental Cost (per day) in dollars} \\
&0.30x + 35 = \text{Trucks-R-Us Rental Cost (per day) in dollars} \\
0.25x + 50 & = 0.30x + 35 \\
0.25x + 50 - 50 & = 0.30x + 35 - 50 \\
0.25x - 0.30x & = 0.30x - 0.30x - 15 \\
-0.05x & = -15 \\
\frac{-0.05x}{-0.05} & = \frac{-15}{-0.05} \\
x & = 300 \Rightarrow 300 \text{ miles}
\end{align*}
\]

For 300 miles the cost of renting the two trucks will be the same.

4. **Solving linear inequalities.** Solve: \(3(x + 2) \leq -4\)

\[
\begin{align*}
3(x + 2) & \leq -4 \\
3x + 6 & \leq -4 \\
3x + 6 - 6 & \leq -4 - 6 \\
3x & \leq -10 \\
\frac{3x}{3} & \leq \frac{-10}{3} \\
x & \leq -\frac{10}{3}
\end{align*}
\]
5. Graphing linear equations. Graph the equation $2x - \frac{1}{2}y = 3$

\[
2x - \frac{1}{2}y = 3 \\
2x - 2x - \frac{1}{2}y = 3 - 2x \\
-\frac{1}{2}y = -2x + 3 \\
-\frac{2}{1} \cdot -\frac{1}{2}y = -2(-2x + 3) \\
y = 4x - 6 \\
\text{Slope} = 4 = \frac{\Delta y}{\Delta x} \\
y\text{-intercept} = (0, -6)
\]

\begin{align*}
\begin{cases}
x + 5y &= -2 \\
3x + 8y &= 8
\end{cases}
\end{align*}
\]

\[
\begin{align*}
\text{Solve for } x & \Rightarrow x + 5y - 5y = -2 - 5y \\
3(-5y - 2) + 8y &= 8 \\
-15y - 6 + 8y &= 8 \\
-15y + 8y - 6 &= 8 \\
-7y - 6 &= 8 \\
-7y &= 14 \\
y &= -2 \\
\end{align*}
\]

\[
\begin{align*}
x &= -5(-2) - 2 \\
x &= +10 - 2 \\
x &= 8 \\
\text{Write solution as an ordered pair} \\
(\text{x, y}) \\
(8, -2)
\end{align*}
\]
7. Performing operations with polynomials. Multiply: \((2x - 3)(3x + 7)\)

\[
(2x - 3)(3x + 7) = 2x(3x) + 2x(7) - 3(3x) - 3(7)
\]

\[
= 6x^2 + 14x - 9x - 21
\]

\[
= 6x^2 + 5x - 21
\]

8. Factoring. Factor completely: \(p^2 + 7p + 6\)

\[
p^2 + 7p + 6 = (p + 6)(p + 1)
\]