Dr. Green

- Undergraduate in Secondary Ed. – Math
- Masters in Math Ed.
- Ph.D. in Pure Mathematics
- Varying experience with many age groups
General Expectations

- Think of me as a “stickler.”
- Learning is a two-way street.
- 15% / 85%
- One rule.
- Looking forward to a great semester!
Syllabus
PURCHASE A *MyLabsPlus* ACCESS KIT, **NOT** A *MyMathLab* ACCESS KIT !!!!!

Before you get started in your course, be sure you have:

- MyLabsPlus Web address from your instructor
- Your **login name** and **password** provided by your school.
- The **access code** you purchased from the bookstore with your textbook.

**Getting Started:**

1. Go to your school's MyLabsPlus campus: [http://sheltonstate.mylabsplus.com](http://sheltonstate.mylabsplus.com)
2. Enter your login name (student's S-number – S12345678 for example) and password (sscc1234) and click the Login button.
3. Click on the name of your course in the course list.

*If your course name does not appear, contact your instructor.*

4. Click on an assignment or learning aid link within the course. You will first be prompted with the License Agreement and Privacy Policy page. **Click I Accept** once you have read the terms of use.

5. You will be prompted to enter your access code or purchase online. To enter your access code, select the Access Code option, enter your code, and click Next.

   If you prefer to purchase online using a credit card, select the Buy Now option and click the product link to complete your purchase.

   Once you have successfully entered your access code or completed an online purchase, you will receive a confirmation page and you can continue working.

**Technical Support:**

If you need technical support, please select the Support tab at your school’s MyLabsPlus campus. You will find several self-service support articles and information about how you can contact Pearson’s 24/7 MyLabsPlus support team.
Questions???
Lesson 1.2
Functions & Graphs
A \textit{relation} is a set of ordered pairs.

e.g. \{-2,1\}, \{(0,4), (-2,7), (1,12)\}

The set of all first components (typically $x$-values) is the \textit{domain} of the relation.

The set of all second components (typically $y$-values) is the \textit{range} of the relation.
Example 1

Find the domain and range of the relation.
{(5,12), (10, 16), (15,18.9), (20, 22), (25, 5)}
Functions

- Special types of relations.
- Each element of the domain corresponds to one element from the range.
  - “Every $x$ is paired with one $y$.”
  - “One input gets one output.”
More on Functions

- A function is a relation in which no two ordered pairs have the same first component and different second components.

- Four Representations
  - Verbally (in words)
  - Numerically (table of values)
  - Visually (a graph)
  - Algebraically (a formula)
Example 2

Determine whether each relation is a function:

A) \{ (1,2), (3,4), (5,6), (5,8) \}

B) \{ (1,2), (3,4), (6,5), (8,5) \}
Functions Represented as Equations

In order to determine if a given relation is a function . . .

1. Solve for $y$ in terms of $x$, and

2. If two or more values of $y$ can be obtained for a given $x$, then the equation is NOT a function.
Example 3

Determine whether the following equation defines $y$ as a function of $x$.

A. $2x + y = 6$

B. $x^2 + y^2 = 1$
Example 3 (cont.)

C. \( 5y - xy = 6 \)

D. \( 3y - |x| = 12 \)
Function Notation

- Algebraic way of representing the rule that assigns a “y” to a given “x.”

- Ex: \( f(x) = 2x + 1 \)
  - “y”  what you do to \( x \)

- Ex: \( f(3) = 2(3) + 1 = 7 \)
  - yields the ordered pair (3, 7).
Example 4

If \( f(x) = x^4 - 2x + 7 \), evaluate the following.

A. \( f(-5) \)

B. \( f(-x) \)
Example 5

If \( f(x) = \sqrt[3]{\frac{x^2 + 8}{x - 1}} \), evaluate the following.

**c.** \( f(4) \)
Example 6

If \( f(x) = x^2 - 3x + 1 \), evaluate the following.

c. \( f(x + h) \)
The Vertical Line Test

- **NOT a fnc.**
- For example, \( x = 2 \) is paired with \( y = 2 \) and \( y = -2 \).

- **A fnc.**
- Each \( x \) is paired with one \( y \).
Vertical Line Test

- Graph the relation. (Use graphing calculator or pencil and paper.)

- Use the vertical line test to see if the relation is a function.

- **Vertical line test** – If any vertical line passes through **more than one point** of the graph, the relation is not a function.
Example 7

Determine if the graph is a function.

A) 

B)
Example 7 (cont.)

C)  

D)
Example 8

Use the graph to estimate the following.

A. \( f(0) \)
B. \( f(9) \)
C. \( f(-2) \)
D. \( f(3) \)
Graphically Identifying the Domain & Range

- For domain, think “how far left to right does the graph go?”
- For range, think “how low to how high does the graph go?”
- Write domain and range using interval or set-builder notation.

<table>
<thead>
<tr>
<th>Interval Notation Examples</th>
<th>Set-Builder Notation Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>([-4, 5)]</td>
<td>({x \mid -4 \leq x &lt; 5})</td>
</tr>
<tr>
<td>((-\infty, 6])</td>
<td>({y \mid y \leq 6})</td>
</tr>
</tbody>
</table>
Example 9

What is the domain and range of the given function?
Example 10

State the domain and range.
Intercepts

**$x$-intercepts**
What’s the $y$-value at this point?

**$y$-intercepts**
What’s the $x$-value at this point?
Algebraic Method for Finding Intercepts

- **x-intercepts:**
  - Plug in 0 for $y$.
  - Solve for $x$.

- **y-intercepts:**
  - Plug in 0 for $x$.
  - Solve for $y$. 
Example 11

State the domain and range and give the \( x \) – and \( y \) –intercepts.