### Chapter 10 Study Guide and Review for Test Form 2A and 2B

#### Chapter 10, Lesson 1: “Linear and Nonlinear Functions” (problems 1 – 3)

Describe why this is a graph of a **Linear Function**:

![Linear Function Graph]

Describe why this is a graph of a **Nonlinear Function**:

![Nonlinear Function Graph]

Describe why this is a function table for a **Linear Function**:

<table>
<thead>
<tr>
<th>x</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
</table>

Describe why these are **Linear Functions**:

\[ y = 0.6x \quad \quad y = \frac{3x}{2} \]

Describe why these are not **Linear Functions**:

\[ y = \frac{4}{x} \quad \quad y = x^3 - 1 \]

#### Chapter 10, Lesson 2: “Graphing Quadratic Functions” (problems 4 - 5)

- Describe how would you select the correct function for the graph shown:
  
  a) \( y = x^2 + 2 \)
  
  b) \( y = 2x^2 - 2 \)
  
  c) \( y = x^2 - 2 \)
  
  d) \( y = -2x^2 + 2 \)

Why is this a **Quadratic Function**?

\[ y = -2x^2 \]

#### Chapter 10, Lesson 4: “Graphing Cubic Functions” (problems 7 & 8)

- Describe how would you select the correct function for the graph shown:
  
  a) \( y = x^3 \)
  
  b) \( y = 2x^3 \)
  
  c) \( y = -x^3 \)
  
  d) \( y = -2x^3 \)

What is a sure way to match a graph with a function?

#### Chapter 10, Lesson 5: “Multiplying Monomials” (problems 9 & 11)

- What is the basic rule for multiplying exponents when the bases are the same \((3^5 \cdot 3^4 \cdot 3^6)\)?

- What is the basic rule for multiplying exponents when the bases are the different \((2^5 \cdot 3^4 \cdot 5^6)\)?

#### Chapter 10, Lesson 6: “Dividing Monomials” (problems 10 & 12)

- What is the basic rule for dividing exponents when the bases are the same \((3^5 / 3^4)\)?

- What do you do when you have a base with a negative exponent \((5^{-4})\)?

#### Chapter 10, Lesson 7: “Powers of Monomials” (problems 13 & 14)

- Describe how you would solve this problem: \((3^5)^6\)?

- Describe how you would solve this problem: \((-3y^4)^2 (4y)^3\)

#### Chapter 10, Lesson 8: “Roots of Monomials” (problems 15 & 16)

- Describe how you would solve this problem: \(\sqrt[4]{\frac{4}{16}} x^4 y^6\)