ESS 102 Math Assessment

AVE Score: 62.0   Std Dev: 25

This is for helping me and my TAs understand where everyone is coming from. NO CALCULATORS. No name needed.

Your High School: _______________________
City and State of you High School: ____________
Intended Major: __________________________
Date and name of last math class: ________________

1. Arithmetic
   a. \( \frac{10}{0.1} = \frac{10}{0.1} \left( \frac{10}{10} \right) = \frac{100}{1} = 100 \) [77%]
   b. \( 2^3 = 2 \times 2 \times 2 = 8 \) [98%]
   c. \( 64^{1/2} = \sqrt{64} = 8 \) (since \( 8 \times 8 = 64 \)) [65%]
   d. \( 2^{-2} = \frac{1}{2^2} = \frac{1}{4} \) or 0.25 (either is fine) [50%]
   e. \( \frac{25 \times 10^3}{5 \times 10^{-5}} = \frac{25}{5} \times \frac{10^3}{10^{-5}} = 5 \times 10^8 = 5 \times 10^8 \) [32%]
   f. \( \frac{231}{7} \) (No Calculator. to tenths place) \( 33.0 \) [76%]

2. Express in Scientific Notation:
   a. \( 0.00012 = 1.2 \times 10^{-4} \) (moving the decimal four spaces to the right means we have to multiply by \( 0.0001 \) or \( 10^{-4} \)) [74%]
   b. \( 300,000 = 3 \times 10^5 \) (moving the decimal point five space to the left means we have to multiply by \( 100,000 \) or \( 10^5 \)) [81%]

3. Geometry
   a. What is the formula for the circumference of a circle? \( C = 2\pi r = \pi d \) [59%]
   b. What is the formula for the volume of a sphere? \( V = \frac{4}{3} \pi r^3 \) [25%]

4. Algebra
   a. \( PV = NkT \) (Solve for \( T \) in terms of \( P, V, N, \) and \( k \)) [84%]
      Divide both sides by \( Nk \)
      \( \frac{PV}{Nk} = \frac{NkT}{Nk} \)
      \( \frac{PV}{Nk} = T \)
b. \( y = \frac{x}{x-1} \) (Solve for x) \([16\%]\)

Multiply both sides by \(x-1\)
\[ y(x - 1) = x \]

Distribute the \(y\)
\[ yx - y = x \]

Bring all \(x\) terms to one side of the equation by subtracting \(yx\) from both sides
\[-y = x - yx\]

Factor out the \(x\) from the right hand side
\[-y = x(1 - y)\]

Divide both sides by \((1-y)\)
\[ x = \frac{-y}{1 - y} \]

Optional last step: multiply top and bottom by \(-1\)
\[ x = \frac{y}{y - 1} \]

c. \( \frac{a}{x} = \frac{b}{c} \) (Solve for \(x\) in terms of \(a\), \(b\), and \(c\)) \([71\%]\)

Multiply both sides by \(x\)
\[ a = \frac{xb}{c} \]

Multiply both sides by \(c\)
\[ ac = bx \]

Divide both sides by \(b\)
\[ x = \frac{ac}{b} \]

Course Makeup:

<table>
<thead>
<tr>
<th></th>
<th>Freshmen: 50%</th>
<th>Humanities: 10.8%</th>
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<tbody>
<tr>
<td>Sophomores:</td>
<td>22.5%</td>
<td>Sciences: 23.5%</td>
</tr>
<tr>
<td>Juniors:</td>
<td>15.4%</td>
<td>Engineering: 18%</td>
</tr>
<tr>
<td>Seniors:</td>
<td>10.7%</td>
<td>Social Sciences: 28%</td>
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<tr>
<td>Other:</td>
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<td>Business: 7.6%</td>
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<td>Undeclared: 12.1%</td>
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