EXAM #1

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Instructions:
You have 50 minutes for this exam, and may use a calculator, but no books or notes. It is intended to be an evaluation of what you understand of the material, so copying work or sharing answers with another student during the exam will result in zero credit for the exam. Write legibly, and circle your final answers. **You MUST show work to receive full credit on most problems.**

Tips on test-taking:

- **Before you start the test, on a page of the test, write down definitions/formulas/steps of procedures you know are important or that you might forget.**

- Raise your hand and have me come over if **your mind goes blank, you get scared or frustrated, or a part of the test seems unclear.**

- If you know how to do a problem, but you keep making a calculation error you can’t find, explain how to do the problem in words!

- Do problems out-of-order. First solve those problems that you find easy – it helps you gain confidence, and lets you focus on the harder problems later.

- If you need extra space for writing your answer to a problem, feel free to ask for extra paper or write on the back of previous pages. Make sure you write a note or arrow to show where your work is.
1. Solve the following equations if possible. If your solution is a fraction, you do not need to convert it. If an equation has no solutions, write “No solutions,” and if it has all real numbers as solutions, write “Infinitely many solutions.” (Remember that you can test numeric answers to see if they’re correct.)

   a) \[
   \frac{4}{7}m - \frac{3}{8} = 2
   \]
   \[
   32m - 21 = 112
   \]
   \[
   32m = 133
   \]
   \[
   m = \frac{133}{32}
   \]
   \[
   (\approx 4.16)
   \]

   b) \[
   5(9 + 6w) = 2(11w + 17) + 8w
   \]
   \[
   45 + 30w = 22w + 34 + 8w
   \]
   \[
   45 + 30w = 30w + 34
   \]
   \[
   -30w
   \]
   \[
   -30w
   \]
   \[
   45 = 34
   \]
   False, so no solutions.

   c) \[
   1 + 9(h - 9) = 7 - 3(h - 5)
   \]
   \[
   1 + 9h - 81 = 7 - 3h + 15
   \]
   \[
   9h - 80 = -3h + 22
   \]
   \[
   +3h
   \]
   \[
   12h - 80 = 22
   \]
   \[
   12h = 102
   \]
   \[
   h = \frac{102}{12}
   \]
   \[
   (\approx 8.5)
   \]

   d) Solve \[
   P = 2L + 2W
   \]
   for \[L\].
   \[
   \frac{-2W}{2} = L
   \]
   \[
   \frac{P - 2W}{2} = L
   \]
   OR simplify more:
   \[
   \frac{P}{2} - \frac{2W}{2} = L
   \]
   \[
   \frac{P}{2} - W = L
   \]

2. Do the following for the inequality \[13r - 17 < 4(r + 11) - 7\].

   a) Solve it algebraically.

   \[
   13r - 17 < 4r + 44 - 7
   \]
   \[
   13r - 17 < 4r + 37
   \]
   \[
   -4r
   \]
   \[
   -4r
   \]
   \[
   9r - 17 < 37
   \]
   \[
   +17
   \]
   \[
   +17
   \]
   \[
   9r < 54
   \]
   \[
   \frac{9r}{9} < \frac{54}{9}
   \]
   \[
   r < 6
   \]

   b) Graph the solutions:

   c) Write the solution set in interval notation: \[(-\infty, 6)\]
Do the following for the inequality \(-16 \leq 5x + 4 < 14\).

a) Solve it algebraically.

\[
\begin{align*}
-16 & \leq 5x + 4 < 14 \\
-4 & \leq 5x < 10 \\
-\frac{4}{5} & \leq x < 2
\end{align*}
\]

b) Graph the solutions:

If consistent

\[\begin{array}{c}
\text{If consistent:} \\
\text{All of}
\end{array}\]

\[\begin{array}{c}
\text{All of}
\end{array}\]

4. Describe the following graphs in two ways: (1) using interval notation and (2) using inequality symbols.

a)

\[\begin{array}{c}
(1, 5) \\
1 < x < 5
\end{array}\]

b)

\[\begin{array}{c}
(-\infty, -4) \cup [0, \infty) \\
x < -4 \text{ or } x \geq 0
\end{array}\]

5. The following table contains the number of hours ten people with part-time jobs worked in a week.

<table>
<thead>
<tr>
<th>18</th>
<th>24</th>
<th>27</th>
<th>18</th>
<th>25</th>
<th>15</th>
<th>11</th>
<th>20</th>
<th>20</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>14</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>20</td>
<td>24</td>
<td>25</td>
<td>27</td>
</tr>
</tbody>
</table>

a) Complete the following table for the above data.

\[
\begin{array}{c c c}
\text{Mean} & = & \frac{192}{10} = 19.2 \\
\text{Median} & = & \frac{18 + 20}{2} = 19 \\
\text{Mode(s), if any} & = & 18, 20 \\
\text{Range} & = & 27 - 11 = 16 \\
\text{Q}_1 & = & 15 \\
\text{Q}_3 & = & 24
\end{array}
\]
b) Which of the quantities (mean, range, etc.) you just calculated provides the data value for which 25% of the data is smaller?

c) Which of the quantities describes the overall width of the data?

d) Create a histogram of the data on the previous page using the following class intervals.

<table>
<thead>
<tr>
<th>Class Intervals</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>10 – 14</td>
<td>2</td>
</tr>
<tr>
<td>15 – 19</td>
<td>3</td>
</tr>
<tr>
<td>20 – 24</td>
<td>3</td>
</tr>
<tr>
<td>25 – 29</td>
<td>2</td>
</tr>
</tbody>
</table>

6. Erik used Google to search with the phrase “Average home price in Federal Way, WA.” The real-estate website Zillow.com gave a “Zillow Home Value Index” of $145,700 for all condominiums in April 2010. The website includes the following explanation of their index:

Zillow Home Value Index
Mid-point of Zestimate valuations for Federal Way. Half the Zestimates are above this number and half are below it.

a) Is this “average” calculating the mean of something? YES / NO (Circle your answer.)

b) If you answered “Yes” to part (a), state which words in the box helped you decide. If you answered “No,” say whether this is calculating one of our other statistics values.

7. Graph the equation $y = 2x - 5$ by calculating and plotting at least FOUR points, then drawing the graph.