

GROUP NAMES: \_\_\_\_\_

UNIT 3: INEQUALITIES/ABSOLUTE VALUE

ALGEBRA 1 PROJECT

EXERCISE? ABSOLUTELY!

MS. PASSARELLA

<b>ESSENTIAL QUESTION:</b>	Depending on your age, should you exercise?
<b>OBJECTIVE:</b>	To investigate heart rate ranges for people of different ages while they are exercising. This will be accomplished by determining different target heart rates using percentages, compound inequalities & absolute value relationships
<b>INFORMATION:</b>	A person's TARGET HEART RATE is expressed as a compound inequality. The inequality is expressed as percentages of your maximum heart rate. For most people, the American College of Sports Medicine recommends a target heart rate while exercising of 50% to 85% of your maximum heart rate. In order to determine this range, you need to do the following: <ol style="list-style-type: none"><li>1. Calculate a person's MAXIMUM HEART RATE, in beats per minute, by subtracting their age from 220. (this rate may be unhealthy)</li><li>2. Calculate the MINIMUM NUMBER in the range by taking 50% of the person's maximum heart rate.</li><li>3. Find the MAXIMUM NUMBER in the range by taking 85% of the person's maximum heart rate</li></ol>

DIRECTIONS: Choose 2 ages (between 10-80, at least 30 years apart) @ complete the following

For each given age, you must complete the following:

- A. Calculate the **Maximum Heart Rate**.
- B. Calculate the **Minimum Number** in the range.
- C. Calculate the **Maximum Number** in the range.
- D. Write the range as a **Compound Inequality** ( $a \leq x \leq b$ ).
- E. Write the range in **Interval Notation**.
- F. **Graph** the compound inequality. Please use multiples of 5 for each tick mark on the graph only labeling multiples of 10.
- G. Determine the **Absolute Value Inequality** using the formula:

$$\left| x - \frac{a+b}{2} \right| \leq \frac{b-a}{2}$$

**\*\* All calculations must show 2 decimal places.**

H. Solve the inequality you made to make sure it matches the graph above to check your work

**I. COMPARE/CONCLUSION:**

Who do you think should exercise more, an older person or younger person? Explain.  
Why is this important?

**J. Higher Order Thinking**

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**Example:** Find the Target Heart Rate range for a 14-year old.

A. Maximum Heart Rate:  $220 - 14 = 206$

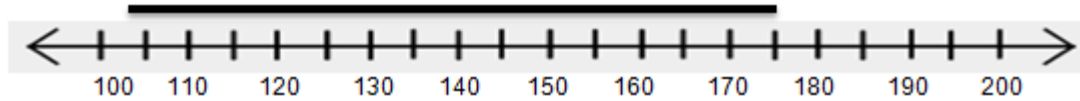
B. Minimum Number in Range:  $x = 103$

C. Maximum Number in Range:  $x = 175.1$

D. Compound Inequality:  $103 \leq x \leq 175.1$

E. Interval Notation:  $[103, 175.1]$

F. Graph of the Compound Inequality:



G. Absolute Value Inequality:  $|x - 139.05| \leq 36.05$

CHECKLIST

Possible Points	Points Earned	Expectation		
70		<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>CALCULATIONS (Young)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> (A) Max heart rate (2)</li> <li><input type="checkbox"/> (B) Min # in range (2)</li> <li><input type="checkbox"/> (C) Max # in range (2)</li> <li><input type="checkbox"/> (D) Set Builder (3)</li> <li><input type="checkbox"/> (E) Interval Notation (3)</li> <li><input type="checkbox"/> (F) Graph (3)</li> <li><input type="checkbox"/> (G) Write inequality (10)</li> <li><input type="checkbox"/> (H) Solve inequality (10)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <b>CALCULATIONS (Young)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> (A) Max heart rate (2)</li> <li><input type="checkbox"/> (B) Min # in range (2)</li> <li><input type="checkbox"/> (C) Max # in range (2)</li> <li><input type="checkbox"/> (D) Set Builder (3)</li> <li><input type="checkbox"/> (E) Interval Notation (3)</li> <li><input type="checkbox"/> (F) Graph (3)</li> <li><input type="checkbox"/> (G) Write inequality (10)</li> <li><input type="checkbox"/> (H) Solve inequality (10)</li> </ul> </td> </tr> </table>	<b>CALCULATIONS (Young)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> (A) Max heart rate (2)</li> <li><input type="checkbox"/> (B) Min # in range (2)</li> <li><input type="checkbox"/> (C) Max # in range (2)</li> <li><input type="checkbox"/> (D) Set Builder (3)</li> <li><input type="checkbox"/> (E) Interval Notation (3)</li> <li><input type="checkbox"/> (F) Graph (3)</li> <li><input type="checkbox"/> (G) Write inequality (10)</li> <li><input type="checkbox"/> (H) Solve inequality (10)</li> </ul>	<b>CALCULATIONS (Young)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> (A) Max heart rate (2)</li> <li><input type="checkbox"/> (B) Min # in range (2)</li> <li><input type="checkbox"/> (C) Max # in range (2)</li> <li><input type="checkbox"/> (D) Set Builder (3)</li> <li><input type="checkbox"/> (E) Interval Notation (3)</li> <li><input type="checkbox"/> (F) Graph (3)</li> <li><input type="checkbox"/> (G) Write inequality (10)</li> <li><input type="checkbox"/> (H) Solve inequality (10)</li> </ul>
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15		<b>Conclusions/Summary</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> (I) Draw conclusion (10)</li> <li><input type="checkbox"/> Use math vocabulary (3)</li> <li><input type="checkbox"/> Explanation is clear/free from errors (2)</li> </ul>		
10		<b>Higher Order Thinking (J)</b>		
5		<b>Final Copy</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Easy to follow</li> <li><input type="checkbox"/> Work distributed evenly</li> </ul>		

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<b>100</b>		<b>TOTAL</b>
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