

GROUP NAMES: _____

UNIT 3: INEQUALITIES/ABSOLUTE VALUE

ALGEBRA 1 PROJECT

EXERCISE? ABSOLUTELY!

MS. PASSARELLA

| | |
|----------------------------|---|
| ESSENTIAL QUESTION: | Depending on your age, should you exercise? |
| OBJECTIVE: | 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 |
| INFORMATION: | 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">1. Calculate a person's MAXIMUM HEART RATE, in beats per minute, by subtracting their age from 220. (this rate may be unhealthy)2. Calculate the MINIMUM NUMBER in the range by taking 50% of the person's maximum heart rate.3. Find the MAXIMUM NUMBER in the range by taking 85% of the person's maximum heart rate |

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: $220 - 14 = 206$

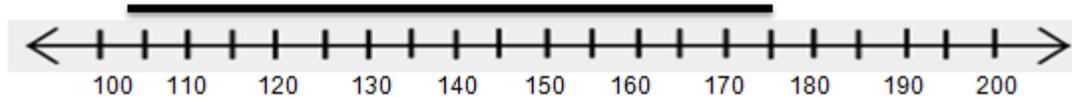
B. Minimum Number in Range: $x = 103$

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

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| | | |
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| 100 | | TOTAL |
|------------|--|--------------|