Dimensional Analysis

What is Dimensional Analysis?

These questions ask you to think about how one variable relates to or interacts with others in an equation. There are 3 possible variations you may see:

- Positive vs. negative
- Increase vs. decrease
- Try out each answer choice

We'll review approaches for each variation. You will see a total of 5 of these types of questions on your exam.

Positive vs. Negative

These questions will provide an equation consisting of multiple variables and will tell you that certain variables are positive or negative. The answer choices will ask you to determine whether the remaining variables are positive or negative.

How to approach:

- Note the information given about which variables are positive and negative directly on your equation.
- Write down whether each remaining variable could be positive or negative before you go to the answer choices.

Q1.
$$W = \frac{QRX}{T}$$

In the formula above, if *W* is positive and *R* is negative, which of the following statements could be true?

A. *T* is positive and *Q* and *X* are negative.

B. *T*, *Q*, and *X* are negative.

C. *T*, *Q*, and *X* are positive.

D. *T* and *Q* are negative and *X* is positive.

Dimensional Analysis

Increase vs. decrease

These questions will provide an equation consisting of multiple variables and will tell you that a certain variable is increasing or decreasing, while the others may remain constant. The answer choices will ask you to determine what happens to a given variable as a result.

How to approach:

- Note the information given about which variables are increasing/decreasing/staying the same directly on your equation.
- Write down whether each remaining variable would increase/decrease/remain constant before you go to the answer choices.

Q2.

$$C = \frac{yz}{wx}$$

In the formula above, if w increases while x, y, and z remain constant, which of the following statements about C is true?

A. C increases.

B. C becomes zero.

C. C decreases.

D. C does not change.

Try out each answer choice

These questions will provide an equation consisting of multiple variables and will ask you to evaluate what happens to one variable if another variable is assigned certain qualities (positive, negative, smaller than, greater than).

How to approach:

- As the name suggests, you will need to try out the condition given in each answer choice to see what happens. This takes a little more time, but you can use the answer choices to help you work efficiently.
- Pick a number for the variable that fits with the new information given and write down the number you try. If the outcome you get doesn't match what the answer choice says, eliminate the choice.
- Be sure to try out all the answer choices, eliminating each time you get a conflicting result.

Q3. $W = \dfrac{R}{3} - 2$

Which of the following statements is true for the formula above?

A. When the value of R is greater than 6, W is negative.

B. When the value of R is less than 6, W is positive.

C. When the value of R is greater than 3, W is positive.

D. When the value of R is less than 6, W is negative.

Dimensional Analysis Drill #1

1.

$$R = \frac{P}{WV^2}$$

In the formula above, if *R* is positive and W is negative, which of the following statements must be true?

A. *V* is negative.

B. *V* is positive.

C. *P* is negative.

D. *P* is positive.

2.

$$A = \frac{BC}{D}$$

In the formula above, if B is positive and *D* is negative, which of the following statements could be true?

A. *A* is negative and *C* is negative.

B. *A* is negative and *C* is positive.

C. *A* and *C* are positive.

D. *A*, *B*, and *C* are positive.

3.

$$K = \frac{H^2}{JMP}$$

In the formula above, if *K* is negative, which of the following statements could be true?

A. *J*, *M*, and *P* are positive.

B. *J* and *M* are negative and *P* is positive.

C. *M* and *P* are negative and *J* is positive.

D. *J* and *P* are positive and *M* is negative.

Dimensional Analysis Drill #1

4.
$$v = \frac{wy}{r}$$

In the formula above, if *w* increases while *v* remains constant, which of the following statements could be true?

A. *y* and *r* remain constant.

B. *y* remains constant and *r* decreases.

C. *r* remains constant and *y* decreases.

D. *r* remains constant and *y* increases.

5. *T = VXY*

In the formula above, if *X* remains constant and *T* increases, which of the following statements could be true?

A. *V* increases and *Y* remains constant.

B. *V* decreases and *Y* remains constant.

C. *V* and *Y* decrease.

D. *Y* decreases and *V* remains constant.

6.
$$w = \frac{25xr}{st}$$

In the formula above, if *w* and *s* remain constant and *x* decreases, which of the following statements could be true?

A. *r* decreases and *t* remains constant.

B. *r* increases and *t* remains constant.

C. *r* and *t* remain constant.

D. *t* increases and *r* remains constant.

Dimensional Analysis Drill #1

7. $x = 5w - 3$

    Which of the following statements is true for the formula above?

    A. If w is greater than 1, then x is negative.

    B. If w is negative, then x is positive.

    C. If w is negative, then x is negative.

    D. If w is greater than 3, then x is negative.

8. $$B = 10 - \frac{C}{4}$$

    Which of the following statements is true for the formula above?

    A. If C is greater than 40, then B is positive.

    B. If C is less than 40, then B is negative.

    C. If C is less than 20, then B is negative.

    D. If C is greater than 40, then B is negative.

9. $7t - 1 = r$

    Which of the following statements is true for the formula above?

    A. When $t > 1$, $r < 0$.

    B. When $t = 0$, $r = 0$.

    C. When $t < 0$, $r > 0$.

    D. When $t < 0$, $r < 0$.

10. $$f = \frac{gh}{5}$$

    Which of the following statements is true for the formula above?

    A. If g and h are each greater than 0, then f is greater than 0.

    B. If $gh = 5$, then $f = 0$.

    C. If g and h are each less than 0, then f is less than 0.

    D. If g is greater than 0 and h is less than 0, then f is greater than 0.