# Jakarta International School

8th Grade – AG1

***Practice Test - BLACK***

Unit 1: Solving Linear Equations

Name: SOLUTIONS

Date:

Score: 22

**Goal 1:** Students understand the meanings of operations and how they relate to one another, especially as a means to solve equations and evaluate expressions.

**Clearly show work. Check Carefully!**

**Solve each equation.**

1. $\frac{8(x-2)}{4} - \frac{(3x+6)^8}{8} = -2^8$ (3 points)

$2(x-2) - (3x+6) = -16$

$-x - 10 = -16$

$\boxed{x = 6}$

Check:

$\frac{6-2}{4} - \frac{18+6}{8} \stackrel{?}{=} -2$

$\frac{4}{4} - \frac{24}{8} \stackrel{?}{=} -2$

$1 - 3 = -2$

$-2 = -2$ ✓

2. $5x+2 = 3x+(8x+2)$ (3 points)

$5x+2 = 11x+2$

$\boxed{x = 0}$

Check:

$5(0)+2 \stackrel{?}{=} 3(0)+(8\cdot 0+2)$

$2 = 2$ ✓

3. Solve for w if $\frac{w}{x} + Pw = R$ (2 points)

$\left(\frac{1}{x} + P\right) w = R$

$w = \frac{R}{\frac{1}{x}+P}$

$w = \frac{R}{\frac{1}{x}+\frac{Px}{x}}$

$\boxed{w = \frac{Rx}{1+Px}}$

4. Find two numbers $x$ and $y$ such that $xy$, $\frac{x}{y}$, and $x+y$ are equal. (3 points)

$xy = \frac{x}{y}$ if $y = 1$, $x = x+1$ ∅

$y^2 = \frac{x}{x}$ if $y = -1$, $-x = x-1$

$y^2 = 1$ $1 = 2x$

$y = \pm 1$ $\frac{1}{2} = x$

So $\boxed{y = -1 \text{ and } x = \frac{1}{2}}$

5. A number, y, is 125% of another number x. What percent of 8y is 5x? (2 points)

$y = \frac{5}{4}x$

What percent of $8y$ is $5x$

$\frac{w}{100} \cdot 8y = 5x$

$\frac{w}{100} \cdot 8 \cdot \frac{5}{4}x = 5x$

$\frac{40w}{400} = 5$

$w = \frac{2000}{40}$

$w = 50$

$\boxed{50\%}$

6. Given the positive integers w, x, y, z with $\frac{w}{x} < \frac{y}{z} < 1$; arrange in order of increasing absolute value the five quantities: $\frac{x}{w}, \frac{z}{y}, \frac{xz}{wy}, \frac{x+z}{w+y}, 1$ (3 points)

Since $\frac{y}{z} < 1$, $\frac{z}{y} > 1$. Since $\frac{w}{x} < \frac{y}{z}$, $\frac{x}{w} > \frac{z}{y}$.

Hence, $1 < \frac{z}{y} < \frac{x}{w}$. Since each of $\frac{z}{y}$ and $\frac{x}{w}$ is greater than 1, then $\frac{xz}{wy}$ is greater than either.

Hence, $1 < \frac{z}{y} < \frac{x}{w} < \frac{xz}{wy}$

AND since $\frac{z}{y} < \frac{x}{w}$ $zw < xy$; therefore, $yz + wz < yz + xy$

and $z(y+w) < y(z+x)$. $\frac{z}{y} < \frac{x+z}{w+y}$. Also, since $xy > wz$,

$wx + xy > wx + wz$, $x(w+y) > w(x+z)$, and therefore $\frac{x+z}{w+y} < \frac{x}{w}$

So, the order is $1, \frac{z}{y}, \frac{x+z}{w+y}, \frac{x}{w}, \frac{xz}{wy}$

7. The largest of n consecutive integers is j. Represent in terms of j the smallest integer S. (2 points)

$S = J - n + 1$

8. x and y are real numbers such that $0 < x < y$. Tell whether the statement is sometimes true, always true, or never true. If it is sometimes true, give a set of values for which it is true and a set of values for which it is false. (2 points)

$\frac{-x^2}{x} < \frac{-xy}{x}$

$\frac{-x}{-1} < \frac{-y}{-1}$

$x > y$ NEVER TRUE