



Jakarta International

School

8th Grade - AG1

Name: SOLUTIONS

Date: _____

Practice Test - Blue

Score: 22

Unit 1: Solving Linear Equations

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 required work. Check Carefully!

Solve each equation. Show your work and check your solutions. (3 points per problem)

1. $5x + 2 = 3x + (8x + 2)$

$5x + 2 = 11x + 2$

$\frac{0}{6} = \frac{6x}{6}$

$0 = x$

check:

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

2. $-5x + 3(2x + 1) = x + 3$

$-5x + 6x + 3 = x + 3$

$x + 3 = x + 3$

Identity

$\therefore x$ can be any number

3. $\frac{1}{3}(2m+3) + \frac{1}{4}(3m+5) = \frac{1}{2}(m-1)$

$4(2m+3) + 3(3m+5) = 6(m-1)$

$8m + 12 + 9m + 15 = 6m - 6$

$17m + 27 = 6m - 6$

$\frac{11m}{11} = \frac{-33}{11}$

$m = -3$

Check:

$\frac{1}{3}(2 \cdot -3 + 3) + \frac{1}{4}(3 \cdot -3 + 5) \stackrel{?}{=} \frac{1}{2}(-3 - 1)$

$\frac{1}{3}(-3) + \frac{1}{4}(-4) \stackrel{?}{=} \frac{1}{2}(-4)$

$-1 + -1 \stackrel{?}{=} -2$

$-2 = -2 \checkmark$

5. $\frac{x-2}{4} - \frac{3x+6}{8} = -2$

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

$2x - 4 - 3x - 6 = -16$

$-x - 10 = -16$

$-x = -6$

$x = 6$

check $\frac{6-2}{4} - \frac{3(6)+6}{8} \stackrel{?}{=} -2$

$1 - 3 \stackrel{?}{=} -2$

$-2 = -2 \checkmark$

4. Solve for E if $I = \frac{EB}{R} + EB$ (2 points)

$RI = EB + EBR$

$\frac{RI}{B+BR} = \frac{(B+BR)E}{B+BR}$

$\frac{RI}{B+BR} = E$

6. Solve the inequality and graph its solution:

(2 points)

$$-6x < 36$$

$$\frac{-6x}{-6} < \frac{36}{-6}$$

$$x > -6$$



7. Let $y_1 = \frac{x-1}{x+1}$. Let y_2 be the simplified expression obtained by replacing x in y_1 by

$\frac{x}{3}$. Let y_3 be the simplified expression obtained by replacing x in y_2 by $\frac{x}{3}$, and so

forth. Evaluate y_4 when $x=0$ (2 points)

$$y_2 = \frac{\frac{x}{3} - 1}{\frac{x}{3} + 1} = \frac{\frac{x-3}{3}}{\frac{x+3}{3}} = \frac{x-3}{x+3} = \frac{x-3}{x+3}$$

$$y_3 = \frac{\frac{x}{3} - 3}{\frac{x}{3} + 3} = \frac{\frac{x-9}{3}}{\frac{x+9}{3}} = \frac{x-9}{x+9}$$

$$y_4 = \frac{\frac{x}{3} - 9}{\frac{x}{3} + 9} = \frac{x-27}{x+27} \quad \text{when } x=0 \quad y_4 = \frac{0-27}{0+27}$$

$$y_4 = \frac{-27}{27}$$

$$y_4 = -1$$

8. The operation $*$ is defined for non-zero integers as follows: $a * b = 1/a + 1/b$. If $a + b = 10$ and $a \times b = 20$, what is the value of $a * b$? Express your answer as a common fraction. (2 points)

$$a * b = \frac{1}{a} + \frac{1}{b}$$

$$a * b = \frac{b+a}{ab}$$

Since $a+b=10$ and $a \times b = 20$

$$a * b = \frac{10}{20}$$

$$a * b = \frac{1}{2}$$

9. Given that $a \times b = a^4 - b^4$, and $a \nabla b = (a-b)(a+b)$, what is the value of $a * (a \nabla b)$ if $a = 4$ and $b = 2$? (2 points)

$$a \nabla b = (4-2)(4+2)$$

$$a \nabla b = 2 \cdot 2 = 4$$

$$a * 4 = 4^4 - 4^4$$

$$a * 4 = 0$$