Maclaren

Jakarta International School

8th Grade – AG1

Summative Assessment

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Grade: A

Standard
Advanced
Highly Advanced

Goal 1: Evaluating Expressions and Problem Solving with Linear Equations

Unit 1 Learning Goals	NP	Green	Blue	Black
Evaluate algebraic expressions by using order of operations		✓		
Solve multi-step equations, utilizing skills such as: • Inverse operations • Distributive property • Combining like terms Blue/Black: Solving linear inequalities.		✓		
Recognizing and understand non-standard solutions		✓		
Solve a formula for a specific variable		✓		
Writing algebraic expressions and equations		✓		
Apply the 4-step problem solving method to a variety of situations. Blue/Black: Communicating understanding of Linear Inequalities		✓		

NP = Not Proficient Green = Standard Level Blue = Advanced Black = Highly Advanced

A	- All learning goals are met within the topic of study - Accurate, clear, organized, and attentive to detail at all times - Sophisticated understanding shown through communication of higher order thinking
B	- Most of the learning goals are met within the topic of study - Accurate, clear, organized, and attentive to detail most of the time - Considerable understanding shown through communication of higher order thinking
C	- Some of the learning goals are met within the topic of study - Accurate, clear, organized, and attentive to detail some of the time - Some understanding shown through communication of higher order thinking
D	- Few or none of the learning goals are met within the topic of study - Rarely accurate, clear, organized, and attentive to detail - Limited understanding shown through communication of higher order thinking

Read all instruction carefully.
Show all steps of your work and check work carefully.

Part I: Evaluating Algebraic Expressions
Answer question #1, choose one from question #2

1 (ALL) Evaluate **12x – 50y** for x = -¼ and y = 2

$12x - 50y$

$12(-\frac{1}{4}) - 50(2)$

$-3 - 100 = -103$ ✓

2 (GREEN)

Evaluate $3p - \frac{4r}{2}$ for p = 4 and r = -1

$3p - \frac{4r}{2}$

$3(4) - \frac{4(-1)}{2}$

$12 - \frac{-4}{2}$

$12 - (-2) = 14$ ✓

2 (BLUE)

Given that
$a \bowtie b = a^b - b^a$, and
$a \nabla b = (a - b)(a - b)$, what is the value of $a \bowtie (a \nabla b)$ if a = 4 and b = 2?

2 (BLACK)

Define $a @ b = ab - b$
Find the value of
$2 @ (3 @ (4 @ (\frac{1}{2} @ 10)))$

Part II: Solving Multi-step Equations

Answer questions #1, 2, and 3, choose one each from questions #3 – 6

1 (ALL) $-3 - 2x = x - 3$

$-3-2x=x-3$

$+\ -x \quad -x$

$-3-x=-3$

$+(+3) \quad +(+3)$

$-x=-6$ ✗

$\frac{-x}{-1}=\frac{-6}{-1}$

$x=6$

2 (ALL) $6(x+2) = 3(2x+4)$

$6x+12=6x+12$

$-12 \quad -12$

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

$x=x$

∴ There are ∞ answers ✓

3 (ALL) $7x - 3(2x - 1) = x + 7$

$7x-6x+3=x+7$

$x+3=x+7$

$-x \quad -x$

$3=7$

∴ There is no answer ✓

4 (GREEN)

$2(x - 3) = 7x - 2x + 12$

$2x-6=7x-2x+12$

$2x-6=5x+12$

$+6 \quad +6$

$2x=5x+18$

$-5x \quad -5x$

$\frac{-3x}{-3}=\frac{18}{-3}$

$x=-6$ ✓

4 (BLUE)

Solve and graph solution

$2(x - 3) - 5x + 10 > -17$

4 (BLACK)

$$1+\frac{4x-2}{x+1}=\frac{3}{5}$$

5 (GREEN)

$\frac{3}{4}x - 10 = 5$

$+10 \quad +10$

$\frac{3}{4}x = 15$

$\cdot\frac{4}{3} \quad \cdot\frac{4}{3}$

$x = 20$ ✓

5 (BLUE)

$\frac{1}{3}(2y-1) = \frac{1}{2}(4-y)$

5 (BLACK)

Solve and graph solution

$\frac{3}{2} \bullet \frac{2}{1} \bullet \frac{1}{2} \bullet \frac{2}{3} \bullet \frac{3}{4} \cdots \frac{k}{1+k} \geq \frac{1}{3}$

6 (GREEN)

$4(x + 1) = 10 + 2(3 + 5x)$

$4x + 4 = 10 + 6 + 10x$

$4x + 4 = 16 + 10x$

$-4x \quad -4x$

$4 = 16 + 6x$

$-16 \quad -16$

$\frac{-12}{6} = \frac{6x}{6}$

$-2 = x$ ✓

6 (BLUE)

$\frac{3y+1}{5} - \frac{2y+1}{7} = 1$

6 (BLACK)

Find **all** pairs of numbers (x, y) such that

$\frac{x-3}{4y-7} = x - 3$

Part III: Solve for a Specific Variable
Answer question #1, choose only one of question #2

1 (ALL) Solve for C if $\frac{9}{5}C+32=F$

$\frac{9}{5}C+32=F$
$-32 \quad -32$
$\frac{9}{5}C=F-32$
$\cdot\frac{5}{9} \quad \cdot\frac{5}{9}$
$C=\frac{5}{9}(F-32)$ ✓

2 (GREEN)	**2 (BLUE)**	**2 (BLACK)**
Solve for S if $R=\frac{S-R}{A}$ $\cdot A \quad \cdot A$ $RA=S-R$ $+R \quad +R$ $RA+R=S$ ✓	Solve for E if $I=\frac{EV-E}{A}$	Solve for E if $W=\frac{E-B}{x}+yE$

Part IV: Writing Algebraic Expressions and Equations
Answer questions #1, choose only one from question #2

1 (ALL) On a recent trip to Office 2000 at PIM 1, you purchased one software package for $25 and two printer cartridges. The total bill with the tax was $52. If the tax was $3 and x represents the cost of each printer cartridge, write an equation that would fit this situation?

$25+2x+3=52$ ✓

$28+2x=52$
$-28 \quad -28$
$\frac{2x}{2}=\frac{24}{2}$
$x=12$

∴ Each printe cartridge cost $12

2 (GREEN)	2 (BLUE)	2 (BLACK)
Create a situation that could match the following equation, tell what x would represent: 2x+10= 50 Janice had 2 big bags of barbles containing the same amount in each. She had a smaller one that had 10 marbles. In all, she had 50. How many marbles did she have in 1 of the big bags. X=# of marbles in 1 big bag $2x+10=50$ $-10\ \ -10$ $\frac{2x}{2}=\frac{40}{2}$ $x=20$ ∴ She had 20 marbles in 1 big bag	Create a situation that could match the following inequality, tell what x would represent: $2x+5\leq 10$	Create a situation that could match the following inequality, tell what x would represent: $\frac{34+x}{47+2x}\geq\frac{60}{100}$

Part V: Applying 4-step Problem Solving
Answer questions #1 and 2, choose one each from questions #3 – 5

1 (ALL) The width of a rectangle is three less than twice the length. If the perimeter is 18 cm, find the length and width.

ℓ = length | $2\ell-3$ = width

$2\ell+2(2\ell-3)=18$

$2\ell+4\ell-6=18$

$6\ell-6=18$

$+6\ \ +6$

$\frac{6\ell}{6}=\frac{24}{6}$

$\ell=4$

Check:

$8+10=18$

∴ length is 4
width is 5

2 (ALL) Two cars travel the same distance. The first car travels at the rate or 40 miles per hour and reaches its destination in t hours. The second car travels at the rate of 55 miles per hour and reaches its destination 3 hours earlier than the first car. How long does it take for the first car to reach its destination?

	R	T	D
C1	40	t	40t
C2	55	t-3	55(t-3)

t = time for 1st car to arrive

$40t=55(t-3)$

$40t=55t-165$

$-55t\ \ -55t$

$\frac{-15t}{-15}=\frac{-165}{-15}$

$t=11$

Check

$40\cdot 11=55\cdot 8$

$440=440$

∴ It took the first car 11 hours to reach the destination

3 (GREEN) Mr. Beder needs to buy new percussion equipment. He needs your help. You and your friends want to assist him. The equipment will cost $2450. You have collected $182 in previous fundraisers. If you sell sandwiches at $3.50 each, how many sandwiches will you need to raise the remaining funds? x = amount of sand whiches $182 + 3.50x = 2450$ $-182 \quad -182$ $\frac{3.50x}{3.50} = \frac{2268}{3.50}$ $x = 648$ check: $182 + 3.50(648)$ $182 + 2268 = 2450$ ∴ you have to sell 648 sand whiches to raise the remaining funds	**3 (BLUE)** In 1990, the enrollment at East Valley High was 840. From 1990 to 1996 the enrollment increased at an average rate of 24 students per year. East Valley was built to hold 900 students. Find the number of years since 1990 that the school's enrollment was no greater than the maximum capacity for which the school was built. a. Write and solve an inequality b. Interpret your results verbally	**3 (BLACK)** You are going to subscribe to a music club and have two options. More Music offers 3 free CDs, after which each CD costs $7. Top Tunes offers 5 free CDs, after which each CD costs $9. a. Write and solve an inequality that shows how many CDs you would have to purchase to make More Music the cheaper option. b. Interpret your results verbally

4 (GREEN)
Julie is five years older than twice John's age. The sum of their ages is 26. How old is each of them?

J = John's age
2J+5 = Julie's age
J+(2J+5)=26
J+2J+5=26
3J+5=26
-5 -5
3J=21
3 3
J=7

Check:
7+19=26
∴ John is 7 and Julie is 19

4 (BLUE)
Betty wants to purchase a bicycle but is $23 short. Claire wants to purchase the same bicycle, but is $25 short. If they combine their money, they will have just enough to buy the bicycle. What is the cost of the bicycle?

4 (BLACK)
In a certain exam, it is noted that the average mark of those passing is 70, while the average mark of those failing is 40. If the average mark of all participants is 60, what percentage of the students failed?

5 (GREEN)
A fox is running 50 feet per second is 160 feet behind the dog running 30 feet per second. How long will it take the fox to catch up to the dog?

	R	T	D
F	50	t	30t+160
D	30	t	30t

50t = 30t + 160
-30t -30t
20t = 160
20 20
t = 80 check
∴ It will take 80 seconds for the fox to catch up with the dog

5 (BLUE)
By car, John traveled from City A to City B in 4.5 hours. At a rate that was 30 mph slower than John's, Peter traveled the same distance in 6 hours. Find the distance between the two cities.

5 (BLACK)
Two trains start toward each other from 2 stations that are 40 miles apart, each traveling at 60 mph. Simultaneously, a bird starts flying from station A, along the track at a speed of 100 mph, toward the train leaving station B. Upon reaching the train, it comes to rest and allows itself to be transported, aboard train B to the point when the trains pass. Find the total distance traveled by the bird.