Midterm A

Math 9 Principles

Name: _____ Block: ____

Please initial this box to indicate you carefully read over your test and checked your work for simple mistakes.

	What I can do in this course	Level
1	I can do Number Skills	
2	I can do Rationals and Irrationals	
3	I can do Exponents	
4	I can do Equalities and Inequalities	

Code	Value	Description
N	Not Yet Meeting Expectations	I just don't get it.
MM	Minimally Meeting Expectations	Barely got it, I need some prompting to help solve the question.
M	Meeting Expectations	Got it, I understand the concept without help or prompting.
E	Exceeding Expectations	Wow, nailed it! I can use this concept to solve problems I may have not seen in practice. I also get little details that may not be directly related to this target correct.

1-1: I can identify numbers on a number line, compare positive and negative numbers, and evaluate absolute values.

1) Evaluate: $\|5 + -9\|$ $= \|-4\|$ $= 4$	2) Evaluate the expression $\|a - b\| - \|b - c\|$ when $a = 2, b = -6$, and $c = 2$. $= \|2 - -6\| - \|-6 - 2\|$ $= \|8\| - \|-8\|$ $= 8 - 8$ $= 0$

1-2: I can combine successive signs and add or subtract two or more integers. (positive or negative)

3) Evaluate: $14 - (-6)$ $= 14 + 6$ $= 20$	4) Evaluate: $(1 - 2) - (-11 - +5)$ $= -1 - -16$ $= 15$

1-3: I can evaluate expressions with integers using correct order of operations.

5) Evaluate: $7 - 2(4)$ $= 7 - 8$ $= -1$	6) Evaluate: $\frac{3(-2)-4(5--1)}{(4-7)(12+-17)}$ $= \frac{-6-4(6)}{(-3)(-5)}$ $= \frac{-6-24}{15} = \frac{-30}{15}$ $= -2$

1-4: I can add or subtract two or more fractions (in mixed number form or improper).

7) Evaluate: $\frac{1}{6} - \frac{7}{15}$ $= \frac{5}{30} - \frac{14}{30}$ $= -\frac{9}{30} = -\frac{3}{10}$	8) Evaluate: $3\frac{3}{4} - 1\frac{5}{6}$ $= \frac{15 \cdot 6}{4 \cdot 6} - \frac{11 \cdot 4}{6 \cdot 4}$ $= \frac{90}{24} - \frac{44}{24}$ $= \frac{46}{24} = \frac{23}{12}$

1-5: ***I can multiply or divide two or more fractions, remembering to simplify before evaluating. I always reduce!***

9) Evaluate: $\frac{12}{25} \cdot \frac{5}{6}$ $\frac{2}{5}$	10) Evaluate: $\frac{21}{5} \div \frac{14}{15} \div 1\frac{1}{3}$ $\frac{27}{8}$

2-1: ***I can convert rational numbers among their two main forms, fractions and decimals (terminating or repeating).***

11) Write the decimal equivalent of $\frac{3}{8}$. 0.375	12) Write the fractional equivalent of $0.\overline{36}$ $\frac{4}{11}$

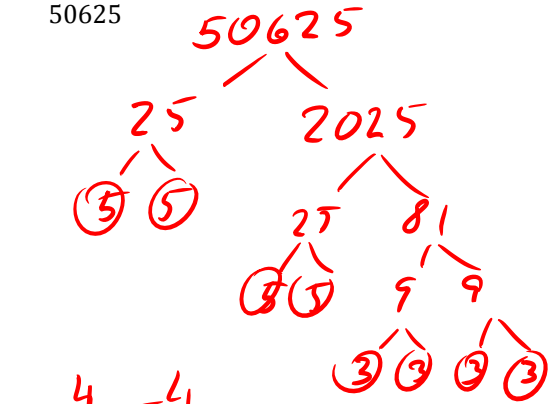
2-2: ***I can convert between percent, fraction, and decimal form for rational numbers.***

13) Write $1\frac{1}{3}$ as a percent. $133.\overline{3}\%$	14) Write 87.5% as a fraction in lowest terms. $\frac{7}{8}$

2-3: ***I can identify a real number as rational or irrational and, if rational, write it as a reduced fraction or integer.***

15) Write $\sqrt{150}$ as a fraction in lowest terms, or state 'irrational'. Irr	16) Write $\sqrt{\frac{64}{9}}$ as a fraction in lowest terms, or state 'irrational'. $\frac{8}{3}$
17) Write $\sqrt{0.04}$ as a fraction in lowest terms, or state 'irrational'. $\frac{1}{5}$	18) Write $\sqrt{1\frac{13}{36}}$ as a fraction in lowest terms, or state 'irrational'. $\frac{7}{6}$

2-4: I can prime factor natural numbers, determine whether they are perfect squares, and if they are evaluate their square root.

19) Test to see if the number below is divisible by any of 2, 3, 4, 5, 6, 9, or 10. 57285 3, 5, 9	20) Prime the number below and list it as a product of its prime factors. Determine whether it is a perfect square. If it is, state the square root. 50625  $= 3^4 \cdot 5^4$ $\sqrt{3^4 \cdot 5^4} = 3^2 \cdot 5^2 = 9 \cdot 25$ $= 225$

2-5: I can evaluate areas and circumferences of circles using radius, diameter, and π

21) What is the circumference of a pizza with an area of 81π cm^2? $r = 9$ $d = 18$ $C = 18\pi$	22) Find the area of a circle with circumference 9π. $r = \frac{9}{2}$ $A = \frac{81\pi}{4}$

3-1: I can convert powers between exponential form, expanded form, and standard form and evaluate using integer, fractions, and decimal bases.

23) Write in expanded form AND evaluate $(5)^3$. $5 \cdot 5 \cdot 5$ 125	24) Write in expanded form AND evaluate $-(-4)^3$. $-(-4)(-4)(-4)$ 64
25) $(0.\overline{6})^2$ $= \left(\frac{2}{3}\right)^2 = \frac{4}{9}$	26) $\left(-3\frac{1}{3}\right)^2$ $= \left(-\frac{10}{3}\right)^2 = \frac{100}{9}$

3-2: ***I can use the exponent laws for products and quotients.***

27) $3^6 \cdot 3^8$

$= 3^{14}$

28) $\frac{2^6 \cdot 2^3}{2^2 \cdot 2^5}$

$= \frac{2^9}{2^7}$

$= 2^2$ or 4

29) $\frac{6561 \cdot 729 \cdot 27}{9 \cdot 243}$

$= \frac{3^8 \cdot 3^6 \cdot 3^3}{3^2 \cdot 3^5}$

$= \frac{3^{17}}{3^7}$

$= 3^{10}$

(59049)

3-3: ***I can use the power of a power exponent law and apply it to coefficients and variables.***

30) $(4^5)^3$

$= 4^{15}$

31) $\frac{(a^2)^2(a^4)^3}{(a^3)^2}$

$= \frac{a^4 \cdot a^{12}}{a^6}$

$= \frac{a^{16}}{a^6}$

$= a^{10}$

32) $\frac{(32x^3)^3(1024x^4)^2}{(512x^3)^2}$

$\frac{(2^5x^3)^3(2^{10}x^4)^2}{(2^9x^3)^2}$

$= \frac{2^{15}x^9 2^{20}x^8}{2^{18}x^6}$

$= \frac{2^{35}x^{17}}{2^{18}x^6}$

$= 2^{17}x^{11}$

3-4: ***I can convert a negative power to a positive power and evaluate a zero power with integer and fraction bases.***

33) -9^0

$= -1$

34) 5^{-3}

$= \frac{1}{5^{-3}}$

$= \frac{1}{125}$

35) $\frac{(x^3)^{-4}x^{-5}}{(x^{-3})^4}$

$= \frac{x^{-12} \cdot x^{-5}}{x^{-8}}$

$= \frac{x^{-17}}{x^{-8}} = x^{-9}$

$= \frac{1}{x^9}$

4-1 I can translate word phrases into algebraic expressions and solve equations using zero sums.

36) $-3x + 15 = -4x + 3$

$+4x \quad -15 \quad +4x \quad -15$

$x = -12$

37) The sum of three consecutive integers is the same as 9 less than twice the first integer. Find the first integer.

$x + x + 1 + x + 2 = 2x - 9$

$3x + 3 = 2x - 9$

$-2x - 3 \quad -2x \quad -3$

$x = -12$

4-2 I can solve equations using zero sums and multiplying and dividing coefficients.

38) $2x - 14 = 7x + 1$

$-2x \quad -2x$

$-14 = 5x + 1$

$-1 \quad -1$

$-15 = 5x$

$x = -3$

39) $18x + 3 - 2x = 14x + 6$

$16x + 3 = 14x + 6$

$-14x \quad -3 \quad -14x \quad -3$

$\frac{2x}{2} = \frac{3}{2}$

$x = \frac{3}{2}$

4-3 I can solve equations involving fractions by clearing the fractions, multiplying by the Least Common Denominator (LCD).

40) $\frac{2}{3}(2x - 5) = 16$

$(3)\frac{2}{3}(2x - 5) = 16(3)$

$\frac{2(2x - 5)}{2} = \frac{48}{2}$

$2x - 5 = 24$

$+5 \quad +5$

$2x = 29$

$x = \frac{29}{2}$

41) $\frac{5x}{6} + \frac{4}{9} = 1$

$18\left(\frac{5x}{6}\right) + 18\left(\frac{4}{9}\right) = 1(18)$

$15x + 8 = 18$

$\frac{15x}{15} = \frac{10}{15}$

$x = \frac{2}{3}$

4-4 I can solve equations involving proportions using cross-multiplication.

42) $\frac{x}{9} = \frac{5}{4}$

$\frac{4x}{4} = \frac{45}{4}$

$x = \frac{45}{4}$

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

$3(3x-2) = 5(x+4)$

$9x - 6 = 5x + 20$

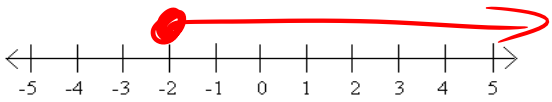
$-5x + 6 \quad -5x + 6$

$\frac{4x}{4} = \frac{26}{4}$

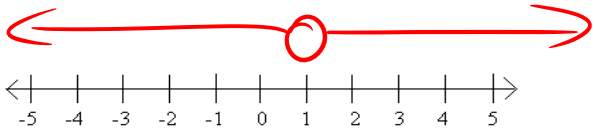
$x = \frac{13}{2}$

4-5 I can solve inequalities and graph the result on a number line.

44) Graph the following inequality on the number line below:
$x \geq -2$.



45) Graph the following inequality on the number line below:
$x \neq 1$.



Solve each inequality. Show your work.

46) $5 - 6x \leq 23$

$-5 \quad -5$

$\frac{-6x}{-6} \leq \frac{18}{-6}$

$x \geq -3$

47) $-3(3n - 6) > 3n$

$-9n + 18 > 3n$

$+9n \quad +9n$

$\frac{18}{12} > \frac{12n}{12}$

$\frac{3}{2} > n$

$n < \frac{3}{2}$