MPM 1D0 | **Semester 1, 2013-2014**

Grade 9 Academic Math

Unit 1 Makeup Test – Number Sense and Algebra

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Victim: Mr. Solutions Great work Mr. S.!!

KU	APP	COM
31/31	16/16	20/20

Terminology (10 COM)

1. Match each term or equation in the left column with the ***best*** definition or description in the right column.

B ✓ Constant	~~A.~~ A symbol that represents an unknown or unspecified value.
A ✓ Variable	~~B.~~ A fixed value.
F ✓ Coefficient	~~C.~~ Any mathematical calculation combining constants and/or variables using any valid mathematical operations.
I ✓ Degree of a term	~~D.~~ To calculate or compute with the objective of finding the "final answer"
G ✓ Equation	~~E.~~ The property used to expand the product of a monomial and a binomial.
C ✓ Expression	~~F.~~ A constant multiplying the variable part of a term.
E ✓ $a(x+y)=ax+ay$	~~G.~~ A mathematical statement asserting that two expressions are equal.
H ✓ Polynomial	~~H.~~ An algebraic expression consisting of several terms.
J ✓ Like Terms	~~I.~~ The sum of the exponents of the variables of a term.
D ✓ Evaluate	~~J.~~ Terms that contain exactly the same variable part.

Modified True/False (3 KU)

Indicate whether the statement is ***true*** or ***false***. If false, change the ***underlined part*** to make the statement true.

2. T/F F ✓ The expression "$3x$" ***means*** "3 beside x." **Change:** 3 times x ✓

3. T/F F ✓ The expression "$x+2x$" ***simplifies to*** "$2x^2$." ✓ = ½ mark **Change:** 3x ✓

4. T/F F ✓ The expression "$\frac{x}{5}$" ***means*** "5 divided by a number." **Change:** $\frac{5}{x}$ ✓

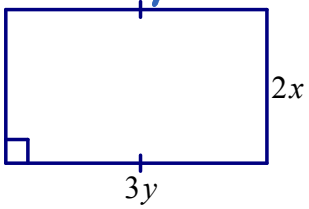
Multiple Choice (3 KU)

Identify the choice that ***best*** completes the statement or answers the question.

5. C ✓ Which expression represents the ***area*** of the rectangle shown at the right?

(a) $2(2x)+2(3y)$ **(b)** $5xy$ **(c)** $6xy$ **(d)** $4x+6y$

A = 2x(3y) = 6xy



6. a or d ✓ Which expression represents the ***perimeter*** of the rectangle shown at the right?

(a) $2(2x)+2(3y)$ **(b)** $5xy$ **(c)** $6xy$ **(d)** $4x+6y$

7. d ✓ In which pair are the expressions ***equivalent***?

~~(a)~~ $-5a^2$ and $(-5a)^2$ ~~(b)~~ $3x$ and x^3 ~~(c)~~ $a-5$ and $5-a$ **(d)** $a-5$ and $-5+a$

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Full Solutions **(10 COM in addition to process marks)**

8. Evaluate. **(8 KU)**

(a) $-4\left(2^2-5^2\right)-4(2-5)^2$

(**BEDMAS** ***not*** distributive property!)

$=-4(4-25)-4(-3)^2$ ✓

$=-4(-21)-4(9)$ ✓

$=84-36$ ✓

$=48$ ✓

(b) $-4ab^2-(4ab)^2$, if $a=\frac{1}{3}$ and $b=-3$

$=-4\left(\frac{1}{3}\right)(-3)^2-[4\left(\frac{1}{3}\right)(-3)]^2$ ✓ ✓

$=\frac{-4}{1}\left(\frac{1}{3}\right)\left(\frac{9}{1}\right)-\left[\frac{4}{1}\left(\frac{1}{3}\right)\left(\frac{-3}{1}\right)\right]^2$

$=\frac{-36}{3}-\left(\frac{-12}{3}\right)^2$ ✓

$=-12-(-4)^2$

$=-12-16$

$=-28$ ✓

9. Simplify. **(17 KU)**

(a) $2x^5+7y-8y-6x^5$

$=2x^5-6x^5+7y-8y$ ✓

$=-4x^5-y$ ✓ ✓

(b) $\left(2x^5\right)(7y)(-8y)\left(-6x^5\right)$

$=2(7)(-8)(-6)(x^5)(x^5)(y^1)(y^1)$ ✓

$=672x^{5+5}y^{1+1}$

$=672x^{10}y^2$ ✓ ✓ ✓

(c) $\frac{81n^{11}}{\left(3n^2\right)^4}-(11n)\left(3n^2\right)$

$=\frac{81n^{11}}{3^4(n^2)^4}-11(3)(n^1)(n^2)$ ✓

$=\frac{81n^{11}}{81n^8}-33n^3$ ✓ ✓

$=\frac{81}{81}\left(\frac{n^{11}}{n^8}\right)-33n^3$

$=1n^3-33n^3=-32n^3$ ✓ ✓

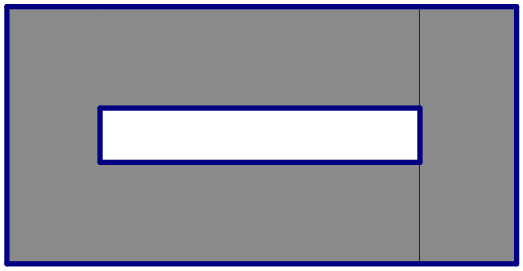
(d) $-4\left(3x^2-5x\right)-6x(x+5)$

$=-12x^2+20x-6x^2-30x$ ✓ ✓

$=-12x^2-6x^2+20x-30x$ ✓

$=-18x^2-10x$ ✓ ✓

10. The area of the entire rectangle is $5x^2-9x-2$ and the area of the ***unshaded*** part is x^2+4x-3. Write a ***fully simplified*** algebraic expression for the area of the ***shaded*** part of the rectangle. **(4 APP)**



$A_{shaded}=A_{\text{entire rectangle}}-A_{unshaded}$

$=5x^2-9x-2-(x^2+4x-3)$ ✓

$=5x^2-9x-2+(-x^2-4x+3)$

$=5x^2-x^2-9x-4x-2+3$

$=4x^2-13x+1$ units^2 ✓ ✓ ✓

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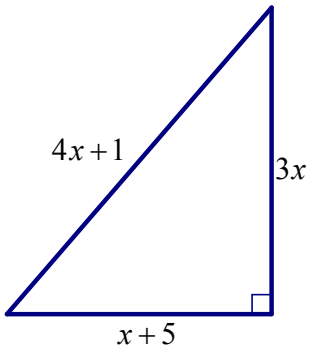
11. The dimensions of a triangle are given in the diagram to the right.



(a) Find a simplified expression for the perimeter of the triangle. **(2 APP)**

$P = 4x+1+3x+x+5$ ✓
$= 4x+3x+x+1+5$
$= 8x+6$ units ✓

(b) Find a simplified expression for the area of the triangle. **(2 APP)**

$A = \frac{1}{2}bh$
$= \frac{1}{2}(x+5)(3x)$ ✓
$= \frac{1}{2}(\frac{3}{1})(x)(x+5)$
$= \frac{3}{2}x(x+5)$ → $= \frac{3}{2}x^2 + \frac{15}{2}x$ ✓

(c) Repeat parts (a) and (b) if the dimensions of the triangle are tripled. **(2APP)**

Perimeter	Area
$P = 3(4x+1)+3(3x)+3(x+5)$ $= 12x+3+9x+3x+15$ $= 12x+9x+3x+3+15$ $= 24x+18$ ✓	$A = \frac{1}{2}[3(x+5)][3(3x)]$ $= \frac{1}{2}(\frac{3}{1})(\frac{3}{1})(\frac{3}{1})(x)(x+5)$ $= \frac{27}{2}x(x+5)$ $= \frac{27}{2}x^2 + \frac{135}{2}x$ ✓

12. Dhanila compares the cost of two gym memberships. *Gym GetRipped(Off)* charges \$50 per month while *Gym GetJacked* charges an initial fee of \$200 in addition to \$30 per month.

m represents # of months

(a) Write an expression that represents what each gym charges. **(3 APP)**

Gym GetRipped(Off): $50m$ ✓

Gym GetJacked: $30m+200$ ✓

(b) Dhanila wants to keep the gym membership for at least 12 months. Which gym should she choose? **(3 APP)** $m = 12$

Gym GetRipped(Off)
$50(12)$
$= 600$ ✓

Gym GetJacked
$30(12)+200$
$= 360+200$
$= 560$ ✓

Dhanila should choose Gym GetJacked because she would only pay \$560 for 12 months, which is \$40 cheaper than Gym GetRipped(Off).

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