**MPM 1D0**

**Grade 9 Academic Math**
**Unit 1 – Practice Test**

| | KU | APP | TIPS | COM |
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| | /25 | /11 | /11 | /22 |

*Name:* _____

## *Terminology*  (12 COM)

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

_____ Binomial      **a.** To raise a power to an exponent, keep the base and multiply the exponents.

_____ Polynomial      **b.** Write a mathematical expression in a simpler form.

_____ Simplify      **c.** A symbol, usually a letter, which represents an unknown or unspecified value.

_____ Equation      **d.** The sum of the exponents on the variables in a term.

_____ Like Terms      **e.** A polynomial with exactly two terms.

_____ Distributive Law      **f.** Any mathematical calculation combining constants and/or variables using any valid mathematical operations.

_____ $\left(a^x\right)^y = a^{xy}$      **g.** Terms that contain exactly the same variable part, that is, exactly the same literal coefficient.

_____ Pythagorean Theorem      **h.** An algebraic expression in which each term consists of constants and/or variables combined using only multiplication (including powers).

_____ Degree of a Term      **i.** $a(x+y) = ax + ay$

_____ Term      **j.** Any mathematical calculation combining constants and/or variables using any operations except for addition and subtraction.

_____ Variable      **k.** A mathematical statement asserting that two expressions are equal.

_____ Expression      **l.** $c^2 = a^2 + b^2$

## *Modified True/False*  (3 KU)

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

**2. T/F** _____ The expression "<u>$x - 6$</u>" means "six reduced by a number."      **Change:** _____

**3. T/F** _____ The expression "<u>$2 + x + 5$</u>" means "double a number increased by 5."      **Change:** _____

**4. T/F** _____ The expression "<u>$4n - 7$</u>" means "one-quarter of a number decreased by 7."      **Change:** _____

## *Multiple Choice*  (3 KU)

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

**5.** Which expression represents the area of the square shown at the right?
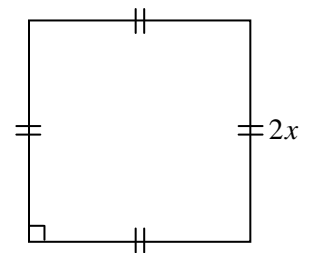
  **(a)** $4x^2$      **(b)** $8x^2$      **(c)** $8x$      **(d)** $2x^2$

**6.** In which pair are the expressions equivalent?

  **(a)** $5m^2$ and $(5m)^2$    **(b)** $(yz)^4$ and $y^4 z^4$    **(c)** $2\left(c^7\right)^3$ and $2c^{10}$    **(d)** $-3a^2$ and $(-3a)^2$

**7.** If $a = -2$ and $c = 5$, what is the value of the expression $\dfrac{a+c}{a^2 - c^2}$ ?

  **(a)** $\dfrac{1}{3}$      **(b)** $\dfrac{3}{29}$      **(c)** $-\dfrac{3}{29}$      **(d)** $-\dfrac{1}{7}$

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

(a) $-3\left(5^2 - 4^2\right) - 6\left(6^2 - 5^2\right)$

(b) $2t^2 - s^3$, if $t = \dfrac{1}{2}$ and $s = 2$

9. Simplify. (**11 KU**)

(a) $\left(x^2 + 5x + 3\right) - \left(-x^2 - 7x + 2\right)$

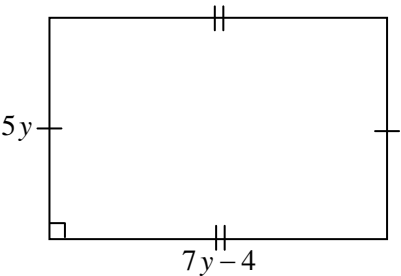(b) $\dfrac{\left(t^2\right)^3 \left(2t^3\right)^4}{\left(4t\right)^3}$

(c) $2y(y-4) - 3y(y-4)$

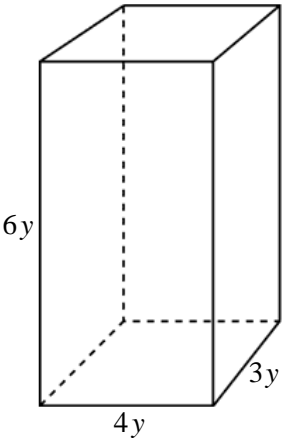10. Write an algebraic expression, in *simplest form*, for the *perimeter* of the figure at the right. (**5 APP**)

$4x + 3$

$3x^2 - x - 2$
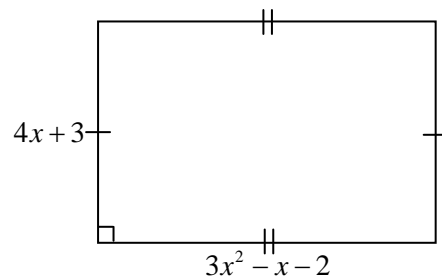
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**11.** Write an algebraic expression, in *simplest form*, for the *area* of the figure at the right. **(3 APP)**

$5y$

$7y-4$

**12.** Write an algebraic expression, in *simplest form*, for the *volume* of the prism shown at the right. (Note that for a prism, $V = l \times w \times h$.) **(3 APP)**

$6y$

$3y$

$4y$

**13.** Two friends, Elliot and Dang, are travelling to the airport in two different taxis. The taxi company used by Elliot charges a $5.00 flat fee plus $0.50 for every kilometre. In Dang's case, the taxi company charges a $3.00 flat fee plus $0.70 for every kilometre. **(6 TIPS)**

**(a)** Write two expressions, one that represents Elliot's cost of travelling by taxi and another that represents Dang's cost of travelling by taxi.

Elliot:                                          Dang:

**(b)** Write an expression that represents Dang's and Elliot's *total cost* of travelling by taxi.

**(c)** If Elliot travelled 35 km and Dang travelled 75 km, how much money did each friend spend?

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**14.** The table below summarizes the results of an experiment studying bacterial growth. At the beginning of the experiment, there are ten bacteria in a dish. Every 12 hours, the number of bacteria doubles. **(5 TIPS)**

| *Time Elapsed (h)* | *Number of Bacteria* |
|---|---|
| 0 | 10 |
| 12 | $10 \times 2 = 20$ |
| 24 | $(10 \times 2) \times 2 = 10 \times 2^2$ <br> $= 40$ |
| 36 | $(10 \times 2^2) \times 2 = 10 \times 2^3$ <br> $= 80$ |
| 48 | $(10 \times 2^3) \times 2 = 10 \times 2^4$ <br> $= 160$ |
|  |  |
|  |  |
|  |  |

**(a)** Extend the values in the table for the next two days.

**(b)** Assuming that the growth rate remains constant, use the pattern in the table to calculate the number of bacteria you would expect to find after 7 days.

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