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 First Name: Answer Key

Date: _____
 Grade 9
 Term 2 Practice Test 3

Scientific Notation/Measurements

1) Write the following in decimal notation.

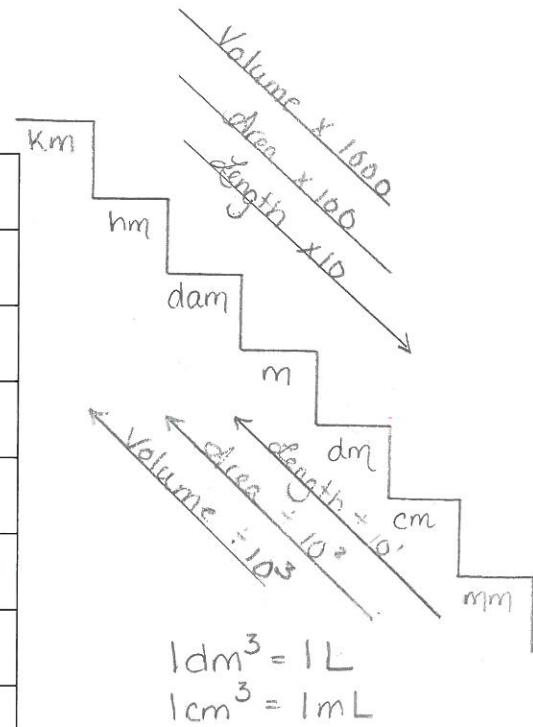
a) $5.638 \times 10^8 = \overbrace{563800000}^{563800000}$	b) $0.00258 \times 10^{12} = \overbrace{2580000000000}^{2580000000000}$
c) $6.24 \times 10^{-3} = \overbrace{0.00624}^{0.00624}$	d) $9.7569 \times 10^{-5} = \overbrace{0.000097569}^{0.000097569}$

2) Simplify. Write each answer in scientific notation. Round to three decimal places if needed.

a) $(8.9 \times 10^3)(6.85 \times 10^{-1})$ $60,965 \times 10^{2+1}$ 6.0965×10^3	b) $(2.57 \times 10^{13})(4.35 \times 10^{-2})$ $11,1795 \times 10^{11+1}$ 1.11795×10^{12}
c) $(3.56 \times 10^{-12})(2 \times 10^{-8})$ 7.12×10^{-20}	d) $(13.2 \times 10^5)(8.5 \times 10^4)$ $112.2 \times 10^{9+2}$ 1.122×10^{11}
e) $\frac{(4.84 \times 10^9)}{(2.2 \times 10^5)} = 2.2 \times 10^4$	f) $\frac{(6.86 \times 10^7)}{(2.2 \times 10^{-2})} = 3.11818 \times 10^9$ 3.118×10^9
g) $\frac{(12.4 \times 10^{-3})}{(2.1 \times 10^{-7})} = 5.904761905 \times 10^4$ 5.905×10^4	h) $\frac{(77 \times 10^{-8})}{(22 \times 10^{-5})} = 3.5 \times 10^{-3}$

3) Convert the following.

a)	$3\text{km} = \underline{300\,000}\text{cm}$
b)	$5.258\text{m} = \underline{0.05258}\text{hm}$
c)	$45685\text{cm}^2 = \underline{456.85}\text{dm}^2$
d)	$345\,500\,000\text{mm}^2 = \underline{345.5}\text{m}^2$
e)	$400\,000\text{dam}^3 = \underline{400}\text{hm}^3$
f)	$0.123\text{dam}^3 = \underline{0.000\,123}\text{hm}^3$
g)	$125\,000\text{cm}^3 = \underline{125}\text{L}$
h)	$99\text{cL} = \underline{990\,000}\text{mm}^3$



4) Determine the length of the missing side. Images are not drawn to scale.

a)

$$a^2 + b^2 = c^2$$

$$x^2 + (7)^2 = (14.8)^2$$

$$x^2 + 49 = 219.04$$

$$x^2 = 219.04 - 49$$

$$x^2 = 170.04$$

$$x = \sqrt{170.04}$$

$$x \approx 13.03993865$$

Answer: $x = 13.04$

b)

$$a^2 + b^2 = c^2$$

$$16^2 + 16^2 = x^2$$

$$256 + 256 = x^2$$

$$512 = x^2$$

$$\sqrt{512} = x$$

$$x \approx 22.627417$$

Answer: $x = 22.63$

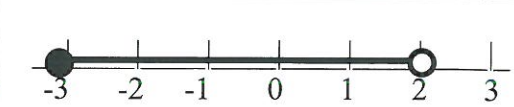
5) Determine if the following statements are **true** or **false**. The entire word must be written.

a. $\mathbb{Z} \subseteq \mathbb{N}$ <u>FALSE</u>	b. $-7.5 \in \mathbb{Z}$ <u>FALSE</u>
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6) TRUE or FALSE. All of the following are irrational numbers. $\sqrt{36}, \sqrt[2]{625}, \sqrt[3]{72}$

Answer: FALSE

7) Complete the following chart.

Inequality	Number line	Bracket Notation
$-3 \leq x < 2$		$[-3, 2[$

8) Write the following as a power of 10.

a) $1\,000\,000\,000 = 10^9$ b) $0.000\,000\,000\,001 = 10^{-12}$

9) State if the following polynomial expressions are monomials, binomials or trinomials.

$4x^2y^3 + 6x^2y^{-3} + 8$ Answer: Trinomial

10) Write the following in exponential form and in standard form.

$\sqrt[3]{64} = 64^{1/3} = 4$

11) Simplify the following expressions so they only have positive exponents.

a) $(5x^{-8}y^3)^{-2} = 5^{-2}x^{16}y^{-6}$ $= \frac{x^{16}}{5^2y^6}$ $= \frac{x^{16}}{25y^6}$	b) $\frac{448x^{-1}y^{-9}}{2x^{-5}} = 224x^4y^{-9}$ $= \frac{224x^4}{y^9}$
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12) Determine the degree of the following polynomial expressions.

$$(2x^3)^7 + 5x^2 + x^{-9} \quad \text{Answer: degree} = \underline{21}$$

$$2^7 x^{21} + 5x^2 + x^{-9}$$

$$128x^{21} + 5x^2 + x^{-9}$$

13) Solve for the unknown variables (no decimals).

<p>a) $4(-3x) - 2 = 5(-8x) - 112$ $-12x - 2 = -40x - 112$ $-12x + 40x = -112 + 2$ $\frac{28x}{28} = \frac{110}{28}$ $x = \frac{110}{28}$ $x = \frac{55}{14}$</p> <p>Answer: $x = \frac{55}{14}$</p>	<p>b) $3(-14x^2) + 80 = -70 - 15x^2$ $-42x^2 + 80 = -70 - 15x^2$ $-42x^2 + 15x^2 = -70 - 80$ $-27x^2 = -150$ $\frac{-27x^2}{-27} = \frac{-150}{-27}$ $x^2 = \frac{50}{9}$ $\sqrt{x^2} = \sqrt{\frac{50}{9}}$ $x = \frac{\sqrt{50}}{\sqrt{9}}$</p> <p>Answer: $x = \frac{\sqrt{50}}{3}$</p>
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14) Simplify the following algebraic expressions. If the equation is already in simplified form rewrite the statement in the space provided.

<p>a) $(2x - 4)(6x + 3)$ $12x^2 + 6x - 24x - 12$ $12x^2 - 18x - 12$</p>	<p>b) $(-4x^3 + 2x^4 - x) \div 4x$ $= \frac{-4x^3}{4x} + \frac{2x^4}{4x} - \frac{x}{4x}$ $= -1x^2 + \frac{1x^3}{2} - \frac{1}{4}$</p>
<p>c) $(5x^3 - x) - (4x^2 - x + 2)$ $5x^3 - x - 4x^2 + x - 2$ $5x^3 - 4x^2 - 2$</p>	<p>d) $(3x + 6y - 7x^2 + 12x - y) + 4$ $-7x^2 + 15x + 5y + 4$</p>

- 15) The perimeter of the rectangle is 52cm. The algebraic expression for the length is $5a-1$. The algebraic expression for the width is $3a+4$. What is the value of the length and width of the rectangle?

$$\text{Perimeter} = 2(\text{Length}) + 2(\text{width})$$

$$52 = 2(5a-1) + 2(3a+4)$$

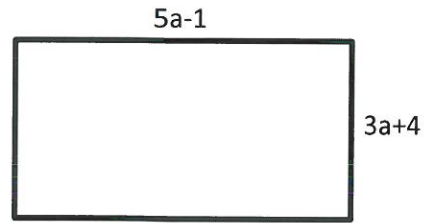
$$52 = 10a - 2 + 6a + 8$$

$$52 = 16a + 6$$

$$52 - 6 = 16a$$

$$\frac{46}{16} = \frac{16a}{16}$$

$$a = 2.875$$



$$\begin{aligned} \text{Length } 5a-1 \\ 5(2.875) - 1 \\ 14.375 - 1 \\ 13.375 \end{aligned}$$

$$\begin{aligned} \text{Width} = 3a+4 \\ = 3(2.875) + 4 \\ = 8.625 + 4 \\ = 12.625 \end{aligned}$$

- 17) Consider the polynomials:

$$A = x^2 - 3x + 11$$

$$B = x^2 + 1$$

$$C = -4x + 1$$

Find.

$$4(A+C) - 2(B)$$

$$= 4[(x^2 + 3x + 11) + (-4x + 1)] - 2(x^2 + 1)$$

$$= 4[x^2 + 3x + 11 - 4x + 1] - 2x^2 - 2$$

$$= 4(x^2 - 1x + 12) - 2x^2 - 2$$

$$= 4x^2 - 4x + 48 - 2x^2 - 2$$

$$= 2x^2 - 4x + 46$$

Answer: _____