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 First Name: Answer Key

Date: _____
 Grade 9
 Term 1 Practice Test 5

Algebra

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

a)	$2x^2y^3$ Answer: <u>monomial</u>	b)	$7x^9 - 8x^2 + 6$ Answer: <u>trinomial</u>
c)	y^0 Answer: <u>monomial</u>	d)	$2x^5 - 4x^4 + 6x^5 = 8x^5 - 4x^4$ Answer: <u>binomial</u>

2) TRUE or FALSE. All of the following are irrational numbers. $\sqrt{2}, \sqrt{64}, \sqrt{168}$
 (Note: $\sqrt{64}$ is circled with an arrow pointing to 8)

Answer: FALSE

3) Determine the degree of the following polynomial expressions.

a)	$(2x^2)^4 = 2^4x^8 = 16x^8$ Answer: degree = <u>8</u>	b)	$5x^4 + 7$ Answer: degree = <u>4</u>
c)	$-6x^5(8x^3)$ Answer: degree = <u>8</u>	d)	$-6 - 2x^8 - 7x^3$ Answer: degree = <u>8</u>

4) Write each of the following as a power of 10.

a) $100\,000 = 10^5$

b) $0.000\,0001 = 10^{-7}$

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

a)	$\sqrt[2]{169} = 169^{1/2} = 13$	b)	$\sqrt[3]{125} = 125^{1/3} = 5$
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6) Simplify the following expressions (only positive exponents and calculated coefficients).

a) $(3x^{-1}y^4)^2 = 3^2 x^{-2} y^8$
 $= \frac{9y^8}{x^2}$

b) $(4a^6b^{-4}c)^3 = 4^3 a^{18} b^{-12} c^3$
 $= \frac{64a^{18}c^3}{b^{12}}$

7) Simplify the following algebraic expressions. If the equation is already in simplified form rewrite the statement in the space provided.

a)	$-x^2 - (3x^2 - 7)$ $-x^2 - 3x^2 + 7$ $-4x^2 + 7$	b)	$5x^{14}y^9 + 7x^9y^{14}$ <p>already simplified</p>
	Answer: <u>$-4x^2 + 7$</u>		Answer: <u>$5x^{14}y^9 + 7x^9y^{14}$</u>
c)	$xy \cdot xy \cdot xy \cdot xy$	d)	$-8x^6y^7z^5 + 16x^{11}y^{10}$ <p>already simplified</p>
	Answer: <u>x^4y^4</u>		Answer: <u>$-8x^6y^7z^5 + 16x^{11}y^{10}$</u>
e)	$-21x^5y^6 + 12x^3y^6$ <p>already simplified</p>	f)	$\left(\frac{-25x^5}{15x}\right)^{-1} = \left(\frac{-5x^4}{3}\right)^{-1}$ $= -\frac{3}{5x^4}$
	Answer: <u>$-21x^5y^6 + 12x^3y^6$</u>		Answer: <u>$-\frac{3}{5x^4}$</u>



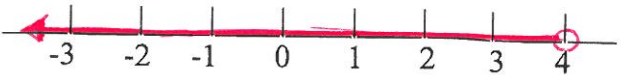

8) Determine if the following statements are **true** or **false**. The entire word must be written.

a.	$\mathbb{N} \subseteq \mathbb{Q}$ TRUE	b.	$-2156 \in \mathbb{Q}$ TRUE
c.	$\mathbb{Q} \subseteq \mathbb{Q}'$ FALSE	d.	$\sqrt[3]{343} \in \mathbb{Q}$ TRUE ↳ 7

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

<p>a) $-5x - 2 = -4x - 89$ $-5x + 4x = -89 + 2$ $\frac{-1x}{-1} = \frac{-87}{-1}$ $x = 87$</p> <p>Answer: <u> $x = 87$ </u></p>	<p>b) $-17x - 5x + 29 = 16 - 14x$ $-22x + 29 = 16 - 14x$ $-22x + 14x = 16 - 29$ $\frac{-8x}{-8} = \frac{-13}{-8}$ $x = \frac{13}{8}$</p> <p>Answer: <u> $x = \frac{13}{8}$ </u></p>
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10) Complete the following chart.

(a)	$x \geq -2$		$[-2, +\infty[$
(b)	$-3 \leq x < 3$		$[-3, 3[$
(c)	$x < 4$		$] -\infty, 4[$
(d)	$-1 \leq x \leq 2$		$[-1, 2]$

11) Consider the polynomials:

$$A = 5x^2 + 4x + 2$$

$$B = -3x^2 + 5$$

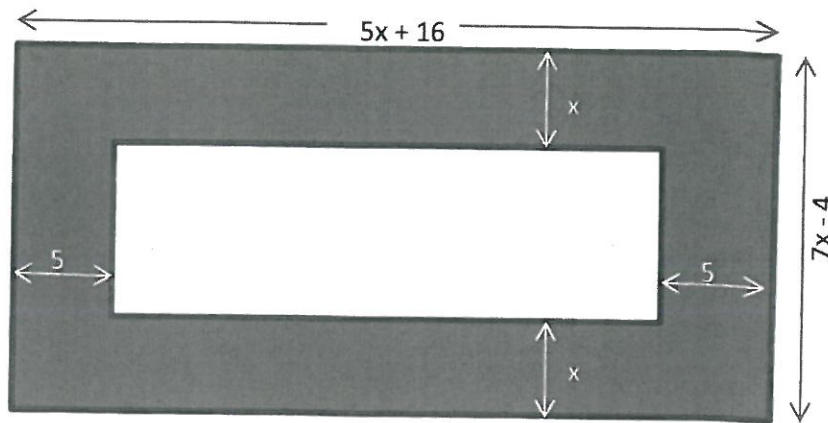
$$C = x - 4$$

Find.

a)	<p>$A + B - C$</p> $(5x^2 + 4x + 2) + (-3x^2 + 5) - (x - 4)$ $5x^2 + 4x + 2 - 3x^2 + 5 - x + 4$ $2x^2 + 3x + 11$ <p>Answer: $2x^2 + 3x + 11$</p>
b)	<p>$3A - 2B$</p> $3(5x^2 + 4x + 2) - 2(-3x^2 + 5)$ $15x^2 + 12x + 6 + 6x^2 - 10$ $21x^2 + 12x - 4$ <p>Answer: $21x^2 + 12x - 4$</p>
c)	<p>$(A)(C)$</p> $(5x^2 + 4x + 2)(x - 4)$ $5x^3 - 20x^2 + 4x^2 - 16x + 2x - 8$ $5x^3 - 16x^2 + 2x - 8$ <p>Answer: $5x^3 - 16x^2 + 2x - 8$</p>

12) Determine the area of the shaded region.

Remember to be clear and organized when showing all your work.



$$\begin{aligned}
 \text{AREA BIG RECTANGLE} &= (\text{Length})(\text{width}) \\
 &= (5x+16)(7x-4) \\
 &= 35x^2 - 20x + 112x - 64 \\
 &= 35x^2 + 92x - 64
 \end{aligned}$$

$$\begin{aligned}
 \text{LENGTH of SMALL RECTANGLE} \\
 (5x+16) - (5) - (5) \\
 5x+16 - 5 - 5 \\
 5x+6
 \end{aligned}$$

$$\begin{aligned}
 \text{WIDTH OF SMALL RECTANGLE} \\
 (7x-4) - (x) - (x) \\
 7x-4 - x - x \\
 5x-4
 \end{aligned}$$

$$\begin{aligned}
 \text{AREA of SMALL RECTANGLE} &= (\text{Length})(\text{width}) \\
 &= (5x+6)(5x-4) \\
 &= 25x^2 - 20x + 30x - 24 \\
 &= 25x^2 + 10x - 24
 \end{aligned}$$

$$\begin{aligned}
 \text{Shaded Area} &= A_{\text{big}} - A_{\text{small}} \\
 &= (35x^2 + 92x - 64) - (25x^2 + 10x - 24) \\
 &= 35x^2 + 92x - 64 - 25x^2 - 10x + 24 \\
 &= 10x^2 + 82x - 40
 \end{aligned}$$