

Last Name: A. Zito
 First Name: Answer Key

Date: _____
 Grade 9
 Term 1 Practice Test 2

Exponents

1) Simplify the following using the laws of exponents

a) $x^3 \cdot x^4 = x^7$

b) $x^3 \div x^2 = x^1$

c) $a^3 \cdot a^2 = a^5$

d) $30x^9 \div 5x^1 = 6x^8$

e) $2x^{12} \cdot 3x^4 = 6x^{16}$

f) $20x^7 \div 5x^8 = 4x^{-1} = \frac{4}{x}$

g) $13x + 20x = 33x$

h) $9x^3 - 6x^3 = 3x^3$

i) $\frac{40x^9}{2x^4} = 20x^5$

j) $\frac{49x^5}{7x^3} = 7x^2$

k) $(5x)^2 = 5^2x^2 = 25x^2$

l) $(6x^3)^3 = 6^3x^9 = 216x^9$

m) $(3x^3)^3 = 3^3x^9 = 27x^9$

n) $(4x^7)^2 = 4^2x^{14} = 16x^{14}$

o) $\left(\frac{4x}{7}\right)^2 = \frac{4^2x^2}{7^2} = \frac{16x^2}{49}$

p) $\left(\frac{9x^5}{b}\right)^2 = \frac{9^2x^{10}}{b^2} = \frac{81x^{10}}{b^2}$

q) $(6x^{-1}y^8)^2 = 6^2x^{-2}y^{16} = \frac{36y^{16}}{x^2}$

r) $(2x^7y^5)^3 = 2^3x^{21}y^{15} = 8x^{21}y^{15}$

s) $(6x^{-1}y^8)^2 = 6^2x^{-2}y^{16} = \frac{x^2}{6^2y^{16}} = \frac{x^2}{36y^{16}}$

t) $(8x^{10}y^{13})^2 = 8^2x^{20}y^{26} = 64x^{20}y^{26}$

2) Write the following using exponents then give the standard form.

Example: $\sqrt{25} = 25^{\frac{1}{2}} = 5$

a) $\sqrt[3]{196} = 196^{\frac{1}{3}} = 14$

b) $\sqrt[3]{81} = 81^{\frac{1}{3}} = 9$

c) $\sqrt[3]{27} = 27^{\frac{1}{3}} = 3$

d) $\sqrt[3]{729} = 729^{\frac{1}{3}} = 9$

3) Write the following in standard form.

a) $2^3 = 8$

b) $13^2 = 169$

c) $4^3 = 64$

d) $8^2 = 64$

4) Solve for the unknown variable.

a) $-2x + 15 = -11$

$$2x = -11 - 15$$

$$\frac{2x}{2} = \frac{-26}{2}$$

$$x = \frac{-26}{2}$$

$$x = -13$$

b) $7x - 23 = -36 - 15$

$$7x - 23 = -51$$

$$7x = -51 + 23$$

$$\frac{7x}{7} = \frac{-28}{7}$$

$$x = -4$$

c) $5x + 3x = 30$

$$\frac{8x}{8} = \frac{30}{8}$$

$$x = \frac{30}{8}$$

$$x = \frac{15}{4}$$

d) $13x + 1x = 7 - 119$

$$\frac{14x}{14} = \frac{-112}{14}$$

$$x = -8$$

5) Write three irrational numbers without using decimals.

$\sqrt{2}$, $\sqrt{17}$, π (other possible answers)

6) Simplify.

a) $(12x^2)^2 = 12^2 x^4$
 $= 144x^4$

b) $(7x^{13})^3 = 7^3 x^{39}$
 $= 343x^{39}$

c) $\left(\frac{6x^5}{13y}\right)^2 = \frac{6^2 x^{10}}{13^2 y^2}$
 $= \frac{36x^{10}}{169y^2}$

d) $\left(\frac{8x^7b}{y^4z^9}\right)^4 = \frac{8^4 x^{28} b^4}{y^{16} z^{36}}$
 $= \frac{4096x^{28}b^4}{y^{16}z^{36}}$

7) Complete the following chart (do not use decimals)

Exponential Expression	Base	Exponent	Factored Form	Standard Form
$(2x)^3$	$2x$	3	$(2x)(2x)(2x)$	$8x^3$
7^{-2}	7	-2	$\left(\frac{1}{7}\right)\left(\frac{1}{7}\right)$	$\frac{1}{49}$
6^4	6	4	$(6)(6)(6)(6)$	1296

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

a. $\mathbb{N} \subseteq \mathbb{Q}'$ FALSE	b. $-5 \in \mathbb{Q}'$ FALSE
c. $\mathbb{Q}' \subseteq \mathbb{N}$ FALSE	d. $\sqrt[3]{729} \in \mathbb{Q}'$ FALSE $9 \in \mathbb{Q}'$

9) Complete the following chart.

(c)	$-1 < x \leq 0$		$] -1, 0]$
(d)	$-3 < x \leq 2$		$] -3, 2]$
(e)	$x \geq -2$		$[-2, +\infty[$