

Last Name: d. Zito
 First Name: Answer Key

Date: _____
 Grade 9
 Term 1 Practice Test 3

Exponents

1) Simplify the following expressions (no decimals).

a)	$\frac{1}{3}x^3 \cdot \frac{1}{6}x^2 = \frac{1}{18}x^5$	b)	$\frac{4}{5}x^2 \cdot \frac{7}{8}x^3 = \frac{28}{40}x^5 = \frac{7x^5}{10}$
c)	$-5x^2 \cdot -3x^9 = 15x^{11}$	d)	$4x^5 \cdot 9x^{-3} = 36x^2$
e)	$x^{-3} \cdot x^{-2} = x^{-5} = \frac{1}{x^5}$	f)	$17x^4 \cdot 16x^8 = 272x^{12}$
g)	$11x^5(-2x^4) = -22x^9$	h)	$7x^{-9}(8x^{-2}) = 56x^{-11} = \frac{56}{x^{11}}$
i)	$(6x)(6y^3) = 36xy^3$	j)	$(4x^{-5})(-4x^6) = -16x$
k)	$56x^5 \div 7x^3 = 8x^2$	l)	$64x^3 \div 4x^{-3} = 16x^6$
m)	$125x^8 \div 5x^{-2} = 25x^{10}$	n)	$72x^5 \div 9x^{19} = 8x^{-14} = \frac{8}{x^{14}}$
o)	$24x^{-3} \div 8x^{-5} = 3x^2$	p)	$15x^{-2} \div 3x^{12} = 5x^{-14} = \frac{5}{x^{14}}$
q)	$35x^7 \div 5x^{-3} = 7x^{10}$	r)	$28x^{-1} \div 4x^{-12} = 7x^{11}$
s)	$\frac{48x^{-5}}{4x^2} = \frac{12x^{-7}}{1} = \frac{12}{x^7}$	t)	$\frac{2x^5}{8x^{-2}} = \frac{1}{4}x^7$

2) Write 3 irrational numbers without using decimals.

Answer: π , $\sqrt{2}$, $\sqrt{17}$

3) TRUE or FALSE. Are all of the following numbers natural numbers? $\sqrt{169}$, 19 , $\frac{24}{3}$, 39

Answer: TRUE

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

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

b. $0.001 = 10^{-3}$

5) Simplify the following expressions (all exponents must be positive).

a) $(x^{51}y)^3 = x^{153}y^3$

b) $(4x^9)^2 = 4^2x^{18} = 16x^{18}$

c) $(6x^{-5}y^{-6})^2 = 6^2x^{-10}y^{-12} = \frac{36}{x^{10}y^{12}}$

d) $(2x^7y^{-6})^3 = 2^3x^{21}y^{-18} = \frac{8x^{21}}{y^{18}}$

e) $\left(\frac{3x}{4}\right)^3 = \frac{3^3x^3}{4^3} = \frac{27x^3}{64}$

f) $\left(\frac{5x^{-2}}{c^7}\right)^2 = \frac{5^2x^{-4}}{c^{14}} = \frac{25}{c^{14}x^4}$

g) $(8x^9)^{-2} = 8^{-2}x^{-18} = \frac{1}{8^2x^{18}} = \frac{1}{64x^{18}}$

h) $\left(\frac{3b^5f^8}{x^{13}y^{-2}}\right)^2 = \frac{3^2b^{10}f^{16}}{x^{26}y^{-4}} = \frac{9b^{10}f^{16}y^4}{x^{26}}$

i) $\left(\frac{4x}{9z}\right)^{-3} = \frac{4^{-3}x^{-3}}{9^{-3}z^{-3}} = \frac{9^3z^3}{4^3x^3} = \frac{729z^3}{64x^3}$

6) Calculate (no decimals).

a)	$-2^2 = -4$ $\rightarrow -(2)(2) = -4$	b)	$(-2)^2 = 4$ $\rightarrow (-2)(-2) = +4$
c)	$6^{-10} \cdot 6^8 \cdot 6^1 = 6^{-1} = \frac{1}{6}$	d)	$7^5 \cdot 7^{-3} = 7^2 = 49$
e)	$(5^2)^{-3} = 5^{-6} = \frac{1}{5^6} = \frac{1}{15625}$	f)	$\left(\frac{4}{7}\right)^{-3} = \frac{4^{-3}}{7^{-3}} = \frac{7^3}{4^3} = \frac{343}{64}$
g)	$4^{-2} \cdot 4^{-5} = 4^{-7} = \frac{1}{4^7} = \frac{1}{16384}$	h)	$(2^3 \cdot 2^2)^2 = 2^5 = 32$
i)	$\left(\frac{7^2}{5}\right)^2 = \frac{7^4}{5^2} = \frac{2401}{25}$	j)	$\left(\frac{4^{-2}}{9^{-1}}\right)^2 = \frac{4^{-4}}{9^{-2}} = \frac{9^2}{4^4} = \frac{81}{256}$

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

<p>a) $5x - 13 = 1x - 72$ $5x - 1x = -72 + 13$ $\frac{4x}{4} = \frac{-59}{4}$ $x = \frac{-59}{4}$</p> <p>Answer: <u>$x = \frac{-59}{4}$</u></p>	<p>b) $-4 - 18x = 22 - 5x$ $-18x + 5x = 22 + 4$ $\frac{-13x}{-13} = \frac{26}{-13}$ $x = -2$</p> <p>Answer: <u>$x = -2$</u></p>
--	--


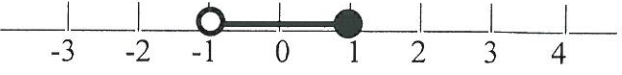

8) Write the following in exponential form and in standard form.

a)	$\sqrt[2]{400} = 400^{1/2} = 20$
b)	$\sqrt[3]{27} = 27^{1/3} = 3$
c)	$\sqrt{144} = 144^{1/2} = 12$

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

a. $3 \in \mathbb{Z}$ TRUE	b. $-\frac{5}{4} \in \mathbb{Q}'$ FALSE
c. $\mathbb{R} \subseteq \mathbb{Q}$ FALSE	d. $\sqrt[3]{55} \in \mathbb{Q}'$ TRUE

10) Complete the following chart.

(a)	$-2 \leq x < 0$	 A horizontal number line with tick marks from -3 to 4. A red line segment is drawn between -2 and 0. At -2, there is a solid red circle. At 0, there is an open red circle.	$[-2, 0[$
(b)	$-1 < x \leq 1$	 A horizontal number line with tick marks from -3 to 4. A black line segment is drawn between -1 and 1. At -1, there is an open black circle. At 1, there is a solid black circle.	$] -1, 1]$
(c)	$x < 2$	 A horizontal number line with tick marks from -3 to 4. A red line is drawn from the left towards 2, ending at an open red circle at 2. A red arrow points to the left from the open circle.	$] -\infty, 2 [$