Math 10 Exponent Review. (I) Name: _____ Block: ___

Part A. 1a) Write as a radical: $17^{\frac{2}{5}} = \left(\sqrt[5]{17}\right)^2$ b) Write 32 as a power of 2 2^5

2. Write as a power: a) $\sqrt[4]{5^{-9}} = 5^{-9/4}$ b) $\left(\sqrt[2]{x^3}\right)^7 = \left(x^{3/2}\right)^7 = x^{21/2}$

Part B: Simplify. No decimals and no negative exponents in final answers.

3) $\left(\frac{x^2}{3}\right)^3 = \frac{x^6}{27}$	4) $(-12x^0) = = -12$
3) $\frac{(2x^3y^2)^2}{(3xy^3)^3} = \frac{4x^6y^4}{27x^3y^9} = \frac{4x^3}{27y^5}$	4) $(-2x^9y^2)^3(3x^4y^3)^2 = = -8x^{27}y^6 \cdot 9x^8y^6 = -72x^{35}y^{12}$
5) $x^{\frac{-3}{4}} \times x^{\frac{9}{4}} = x^{3/2}$	6) $x^{\frac{3}{2}} \div x^{\frac{2}{3}} = x^{5/6}$
7) $\left(2x^{\frac{2}{4}}y^{\frac{1}{2}}\right)^4 = 8x^{8/2}y^{4/2} = 16x^4y^2$	8) $\left(9x^{\frac{3}{4}}y^{\frac{-1}{3}}\right)^{\frac{-3}{2}} = 9^{-3/2}x^{-9/8}y^{3/6} = \frac{y^{1/2}}{9^{3/2}x^{9/8}} = \frac{y^{1/2}}{27x^{9/8}}$
9) $32x^{\frac{1}{2}} \div 4x^{\frac{3}{4}} = 8x^{-1/4} = \frac{8}{x^{1/4}}$	10) $(x^2)^a(x^{a+2})^3 = x^{2a} \cdot x^{3a+6} = x^{5a+6}$
11) $4^2 - 4^{-1} = 16 - \frac{1}{4} = 15\frac{3}{4}$ or $\frac{63}{4}$	12) $5^2 \times 5^4 \div 5^3 = 5^6 \div 5^3 = 5^3 = 125$

Part C: Evaluate. Don't express answers as decimals. Integers &fraction answer only.

1) $81^{\frac{3}{2}} = (\sqrt{81})^3$ $= 9^3$ $= 729$	2) $81^{-0.5} = 81^{-\frac{1}{2}}$ $= \frac{1}{81^{\frac{1}{2}}} = \frac{1}{\sqrt{81}} = \frac{1}{9}$
3) $3^{-2} = \frac{1}{3^2}$ $= \frac{1}{9}$	4) $\left(\frac{7}{6}\right)^{-2} = \left(\frac{6}{7}\right)^2$ $= \frac{36}{49}$
5) $\left(\frac{3^{-1}}{3^2}\right)^{-1} = \frac{3}{3^{-2}}$ $= 3 \cdot 3^2$ $= 3^3$ $= 27$	6) $\left(16^{\frac{-2}{3}}\right)^{\frac{-3}{4}} = 16^{\frac{6}{12}}$ $= 16^{\frac{1}{2}}$ $= \sqrt{16}$ $= 4$
7) $(3)^{-2} + (-3)^2 =$ $= \frac{1}{9} + 9$ $= 9\frac{1}{9}$ or $\frac{82}{9}$	8) $10^{-8} \div 10^{12} \times 10^{-6} = 10^{-26}$ $= \frac{1}{10^{26}}$
10) $(-64)^{\frac{3}{2}} = (\sqrt{-64})^3$ No solution	10) $(-343)^{\frac{2}{3}} = (\sqrt[3]{-343})^2$ $= (-7)^2$ $= 49$
12) $25^{\frac{1}{2}} \times (-27)^{\frac{2}{3}} =$ $= \sqrt{25} \cdot (\sqrt[3]{-27})^2$ $= 5 \cdot (-3)^2$ $= 45$	12) $\left(\frac{1}{100}\right)^{\frac{1}{2}} + (5)^{-2} =$ $= \frac{1}{\sqrt{100}} + \frac{1}{5^2}$ $= \frac{1}{10} + \frac{1}{25}$ $= \frac{7}{50}$

Part D: Sequences.

General formulas: $t_n = a + (n-1)d$ $\quad S_n = \frac{(a+t_n)}{2} \times n$ $\quad t_n = ar^{n-1}$

1. Given the following sequence: -7, 3, 13, . . . , find the 19th term.

$t_{19} = -7 + (19-1)(10)$

$t_{19} = 173$

2. Given the following sequence 2, 23, 44, 65, 86, 107, find the missing terms.

$2 + 5d = 107$

$5d = 105$

$d = 21$

3. How many terms are in the following sequence? -3, 2, 7, ..., 152

$152 = -3 + (n-1)(5)$ $\quad \therefore n = 32$

$152 = -3 + 5n - 5$

$160 = 5n$

4. Given the following sequence: 80 + 76 + 72 + . . . find S_{30}.

$t_{30} = 80 + (30-1)(-4)$ $\quad S_{30} = \frac{(80 + (-36))30}{2}$

$t_{30} = -36$ $\quad S_{30} = 660$

5. Given the following geometric series: 0.04, 0.2, 1, 5, . . . , find t_8.

$r = \frac{5}{1}$ $\quad t_8 = 0.04(5)^{8-1}$

$r = 5$ $\quad t_8 = 3125$

6. Find the sum of the following sequence: 5 + 9+ 13 + . . . + 201.

$201 = 5 + (n-1)(4)$ $\quad \boxed{5150}$

$200 = 4n$

$50 = n$