## <u>Precalculus</u> <u>Summer</u> <u>Packet</u>

## Instructions:

- Each answer must be accompanied by a complete solution on loose leaf. Make sure all sheets used for your solutions are stapled to this packet.
- Packets are to be submitted on the first day of school of the 2023–2024 academic year.
- ➤ Have an enjoyable and safe summer vacation!!!

Student Name: \_\_\_\_\_

Family: \_\_\_\_\_

Date submitted: \_\_\_\_\_

## International Leadership Charter High School

1) Nancy Ocampo thinks that any number to the 0 power is 1, and 0 to any power is 0. She wants to know whether  $0^0$  equals 1 or 0. Justify your answer.

**I.** Simplify the expressions.

2) 
$$\left(\frac{x^7}{y^4}\right)^8 \left(\frac{y^{10}}{x^{10}}\right)^3$$
  
3)  $\left(\frac{10 \ p^{12} n^7}{5 \ p^3 n^5}\right)^6$   
4)  $\frac{(9^{54})^{10}}{(9^{49})^{11}}$ 

**II.** Use the properties of exponentiation to simplify the expression. Write the answers as products of powers, with **no variables in denominators**.

5) 
$$(1001x^{-4}y^{-3}) \div (77x^{6}y^{-7})$$
  
6)  $\frac{3^{4}a^{-7}b^{3}d^{-4}}{43^{0}a^{-4}b^{-5}c^{6}}$   
7)  $\left(4x^{-\frac{1}{2}}\right)^{3} \div \left(9x^{\frac{1}{3}}\right)^{-\frac{3}{2}}$ 

**III.** Simplify. Write the answer in exact form, as a fraction if necessary.

8)  $\sqrt[6]{256} \div \sqrt[4]{64}$ 9)  $(-64)^{\frac{2}{3}}$ 10)  $-64^{\frac{2}{3}}$ 11)  $\left(-\frac{125}{27}\right)^{-\frac{4}{3}}$ 12)  $\sqrt[3]{128} \cdot \sqrt{32}$ **IV.** Transform the gire

**IV.** Transform the given expression to simple radical form. You can check your answer by evaluating it and the original expression by calculator.

13) 
$$3\sqrt{125} - 2\sqrt{80} + \sqrt{405}$$
  
14)  $\sqrt[3]{108} + 10\sqrt[3]{32} + \sqrt[3]{500}$   
15)  $\frac{2}{\sqrt[3]{9}}$ 

16) 
$$\frac{7}{\sqrt[4]{49}}$$
  
17)  $\frac{1 + \frac{1}{\sqrt{3}}}{1 - \frac{1}{\sqrt{3}}}$ 

**V.** Factor the polynomial completely.

- 18)  $x^6 y^6$
- 19)  $9x^2 56x + 12$
- 20)  $5x^3 + 6x^2 45x 54$
- VI. Convert the quadratic trinomial to completed square form.
- 21)  $2x^2 + 9x 20$

VII. Solve:

- 22)  $x^2 x 6 = 0$  by factoring.
- 23)  $(x + 3)^2 = 16$  by extracting square roots.
- 24)  $x^2 + 6x = 5$  by completing the square.
- 25)  $2x^2 + 3x 1 = 0$  by quadratic formula.