## Simplifying Radical Expressions Homework

**Directions:** Be sure to show all work, communicate your thought process, and justify your reasoning. Remember to check that your answers are complete, correct, and reasonable. Do not forget to complete the "Throwback" problems! ③

## Write each expression in simplest radical form.

- 1.  $\sqrt{50r^9s^{13}t^{20}}$ 2.  $\sqrt[3]{-16x^7y^{33}z^2}$ 3.  $\sqrt[4]{625x^{56}y^{12}z}$ 4.  $\sqrt[5]{-243t^{13}u^{25}v^{18}}$ 5.  $\sqrt{392m^8n^{41}p^{23}}$ 6.  $(\sqrt{36p^{10}q^{28}})^3$ 7.  $(\sqrt[7]{q^{63}r^7s^{14}})^2$ 8.  $\sqrt[8]{q^{28}r^{32}s^{47}}$ 9.  $\sqrt[3]{-27h^9j^{40}}$ 10.  $(\sqrt[3]{27p^{12}q^{15}})^4$ 11.  $(\sqrt[5]{-32w^{15}r^{70}x^{10}})^2$ 12.  $(\sqrt[4]{16v^{24}q^{80}})^2$
- 13. Multiple Choice: Which expression is equivalent to  $(\sqrt[5]{243})^4$ ?
  - a. 20 b. 3<sup>5</sup> c. 9<sup>2</sup> d. 81<sup>4</sup>

14. Multiple Choice: Which expression is equivalent to  $(\sqrt[7]{128})^{s}$ ?

a. 56 b.  $2^7$  c.  $16^4$  d.  $4^4$ 

## THROWBACK!

- 1. The expression  $x^4 256$  can be rewritten in the form  $(x^2 + a)(x + b)(x + c)$ . What are the values of a, b, and c?
- 2. Write the correct factored form for the function having zeros  $\frac{3}{4}(M. 2)$ , -1, and 4(M.3).
- 3. Factor  $3x^4 11x^2 4$ .

4. How many solutions will the equation -x - 1 = |x| + 5 have? (Hint: Think in terms of the number of intersections of the graphs of the functions!)

## Selected Solutions:

0.

Throwback:

1.  $x^4 - 256 = (x^2 + 16)(x^2 - 16) = (x^2 + 16)(x + 4)(x - 4)$ . Therefore, a = 16, b = 4, and c = -4.

2. 
$$(4x-3)(4x-3)(x+1)(x-4)(x-4)(x-4)$$

3. 
$$(3x^2 + 1)(x^2 - 4) = (3x^2 + 1)(x - 2)(x + 2)$$

4. The equation will have no solutions. The slope of -x - 1 is the same as the slope of the left side of the graph of |x|, making them parallel. -x - 1 is a line that will pass through (0,-1) and the vertex of the absolute value function |x| + 5 is (0,5). Therefore, the graphs will never intersect, implying that no values for x will result in the same output for both functions.