

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

Score: \_\_\_\_\_ /15

## Worksheet 9 (Due Mon, May 19)

Math 1060Q – Summer 2014

Professor Hohn

You must show all of your work to receive full credit!

1. Evaluate  $\frac{3^{-2}}{2^{-3}}$ .

2. Write  $2^{30} \cdot 4^3$  as a power of 2.

3. Write  $3^4 \cdot 9^6 \cdot 27^3$  as a power of 3.

4. Simplify the following by writing it as a power of a single variable.

(a)  $x^5(x^2)^3$

(b)  $t^4(t^2(t^{-2}))$

(c)  $y^5(y^{-3}(y^2(y^{-4})))$

5. Write  $\frac{25^8}{5^6}$  as a power of 5.

6. Simplify the following.

(a)  $\frac{x^1 1 (y^2)^3}{(x^3)^5 (y^2)^4}$

$$(b) \frac{x^{-11}(y^{-2})^3}{(x^3)^{-2}(y^2)^{-4}}$$

$$(c) \frac{(x^2y^{-5})^2}{(x^{-3}y^{-1})^2y^{-5}}$$

$$(d) \left( \frac{(x^{-3}y^5)^{-3}}{(x^{-5}y^{-2})^2} \right)^{-2}$$

7. Expand  $(2 + \sqrt{5})^2$ .

8. Find all  $x$  that satisfy

$$x - 5\sqrt{x} + 6 = 0.$$

9. Find all  $x$  that satisfy

$$x - \sqrt{x} = 6.$$

10. Find all  $x$  that satisfy

$$x^4 - 3x^2 = 10.$$

11. Evaluate the following.

(a)  $25^{\frac{3}{2}}$

(b)  $32^{-\frac{4}{5}}$

(c)  $(-8)^{\frac{7}{3}}$

12. Suppose  $f(x) = x^{12}$ . Find a formula for  $f^{-1}$ .

13. Suppose  $f(x) = x^{\frac{-7}{2}}$ . Find a formula for  $f^{-1}$ .

14. Suppose  $f(x) = \frac{x^4}{81}$ . Find a formula for  $f^{-1}$ .

15. Suppose  $f(x) = x^6 - 5$ . Find a formula for  $f^{-1}$ .

16. Show that  $\sqrt{5} \cdot 5^{\frac{3}{2}} = 25$ .

17. Find all real numbers  $x$  such that  $x^6 - 3x^3 - 10 = 0$ .

18. Verify that  $(x - y)(x^2 + xy + y^2) = x^3 - y^3$ .

19. Find the zeros and end behavior of the function  $h(x) = (x - 2)(x + 2)(x - 3)$ . Sketch  $h(x)$ .

20. Find the zeros and end behavior of the function  $p(x) = (x + 3)(x - 2)(x - 1)$ . Sketch  $p(x)$ .

21. Find the zeros and end behavior of the function  $w(x) = (x^2 - 4x - 21)(x - 3)$ . Sketch  $w(x)$ .