**Module 4 Quiz Review**

(Rational Expressions and Functions 4.1 – 4.4)

1. Solve and decide whether x = 1 is a solution.

 a. $x^{2}-7x+8=16$

b. $x^{3}+8x^{2}-9x=0$

 c. $x^{2}+5x+3=9$

d. $x^{2}-1=0$

2. Solve and determine the roots: $f\left(x\right)=\frac{x^{2}+7x+10}{x+4}$

3. Solve the following equations and find the extraneous solutions if possible?

|  |  |
| --- | --- |
| a. $\sqrt{x-3}=5$  | c.$\frac{x^{2}-3x+2}{x-1}=0$  |
| b. $x-12=\sqrt{x}$  | d. $\sqrt{x-9}=1$ |

4. List everything you know about rational expressions.

5. Explain the end behavior of all proper rational functions

6. give an example of an odd function and make a sketch.

7. Give an example of an even function and make a sketch.

8. Decide whether x=-3 is a solution to the following function

 $\frac{4}{(x-3)(x+4)(x-1)}=0$

9. Give two examples of proper rational functions

10. What is the degree of the following polynomials?

 a. $0x^{3}+5x^{2}+x+2$

b. $3x^{3}+0x^{2}+4x+4$

 c. $x^{3}-2x^{2}+0x-4$

d. $x^{3}-2x^{2}-x+0$

11. Give three examples of rational expressions

Find the **roots** and **domain** to the following equations:

|  |  |  |
| --- | --- | --- |
| 12. $f\left(x\right)=(x-6)(x+2)$ | 13. $g\left(x\right)=\frac{x^{2}-7x-8}{x-3}$ | 14. $h\left(x\right)=\frac{x+4}{x^{2}+7x+12}$ |
| Root(s): | Root(s): | Root(s): |
| Domain: | Domain: | Domain: |

 Below you have Improper Rational Expressions written as $\frac{a(x)}{b(x)}$ . Use long division to rewrite the expressions as $q\left(x\right)+\frac{r(x)}{b(x)}$

|  |  |  |  |
| --- | --- | --- | --- |
| 15. | $$\frac{4x^{2}-3}{x+1}$$ | 16. | $$\frac{x^{3}+3x-1}{x^{2}+2}$$ |

17. Write a function that has a root at $=4$ , a domain where $x\ne 0, -2$, and exactly one extraneous solution. You may leave your function in factored form.