Calculus **Name**_____ **Period**_____

Unit 1.3 Notes: Algebraic Domains

Warm Up: At what x-values are these functions <u>defined</u>? Use interval notation.

1. $\frac{1}{x-4}$ Domain: _____

2. $\sqrt{x}$ Domain:_____

3. x^2-2 Domain:_____

4. $\frac{x-1}{\sqrt{x}}$ Domain:_____

Perform the indicated operations given the following functions and state the domain in interval notation.

$f(x)=x^2+4$ $g(x)=\sqrt{x-7}$ $h(x)=\frac{2}{x-3}$ $k(x)=2x-1$

5. _____ $(f+k)(x)$

_____ domain of $(f+k)(x)$

_____ $(f+k)(3)$

6. _____ $(f-k)(x)$

_____ domain of $(f-k)(x)$

_____ $(f-k)(5)$

7. _____ $(hk)(x)$

_____ domain of $(hk)(x)$

_____ $(hk)(10)$

8. _____ $\left(\frac{f}{g}\right)(x)$

_____ domain of $\left(\frac{f}{g}\right)(x)$

_____ $\left(\frac{f}{g}\right)(16)$

Let's identify some domains using interval notation.

9. Domain: _____ $f(x)=\frac{4}{x+7}$

10. Domain: _____ $f(x)=\frac{x-5}{x^2-3x-18}$

11. Domain: _____ $f(x)=\sqrt{3x+5}$

12. Domain: _____ $f(x)=\frac{x}{\sqrt{3x+5}}$

Use sign chart analysis to identify domains. Write the domain in interval notation.

13. Domain: _____ $f(x)=\frac{1}{2x^3+10x^2+12x}$

14. Domain: _____ $f(x)=\sqrt{x^2-7x-30}$

15. Domain: _____ $f(x)=\frac{1}{\sqrt{x^2-25}}$

Calculus **Name:** _____

HW 3: Unit 1.3 - Algebraic Domains of Functions

Perform the indicated operations given the following functions and state the domain

$f(x) = x^2 - 5$ $g(x) = \sqrt{x - 11}$ $h(x) = \frac{2}{x-7}$ $k(x) = 2x - 3$

1. _____ $(f - k)(x)$

   _____ domain of $(f - k)(x)$

   _____ $(f - k)(7)$

2. _____ $(hk)(x)$

   _____ domain of $(hk)(x)$

   _____ $(hk)(12)$

3. _____ $\left(\frac{g}{f}\right)(x)$

   _____ domain of $\left(\frac{g}{f}\right)(x)$

   _____ $\left(\frac{g}{f}\right)(20)$

4. _____ $\left(\frac{h}{k}\right)(x)$

   _____ domain of $\left(\frac{h}{k}\right)(x)$

   _____ $\left(\frac{h}{k}\right)(9)$

State the domain and support your answer algebraically or with sign chart.

5. _____ $f(x)=\frac{1}{x^2-36}$

6. _____ $f(x)=\frac{\sqrt{x-4}}{x^2-3x-18}$

7. _____ $f(x)=\frac{x+8}{\sqrt{9-x^2}}$

8. _____ $f(x)=\frac{\sqrt{x^2-49}}{x^2+5}$

9. _____ $f(x)=\frac{1}{\sqrt[3]{x+13}}$

10. _____ $f(x)=\sqrt[6]{x^2+6x+9}$