Domain and Range

name_____
date _____ block _____

The domain of a function f is taken to be the set consisting of every real number for which the rule of f produces a real number.

Determine the domain of the function.

1. $f(x) = x^2$ $\mathbb{R}$ $(-\infty, \infty)$

2. $f(x) = x + 5$ $\mathbb{R}$ $(-\infty, \infty)$

3. $f(x) = -5x + 4$ $\mathbb{R}$ $(-\infty, \infty)$

Find the domain of each function:

1. $k(x) = \dfrac{x^2 - 6x}{x - 1}$ $x \neq 1$ $(-\infty, 1) \cup (1, \infty)$

2. $f(t) = \sqrt{t + 2}$ $t \geq -2$ $[-2, \infty)$

3. $f(x) = \dfrac{4}{\sqrt{x - 9}}$ $x > 9$ $(9, \infty)$

4. $h(t) = \sqrt{4 - 3t}$ $t \leq \frac{4}{3}$ $(-\infty, 4/3]$

5. $f(x) = \dfrac{x}{x^2 + 1}$ $\mathbb{R}$ $(-\infty, \infty)$

6. $f(x) = \dfrac{x}{x^2 - 16}$ $x \neq 4, -4$ $(-\infty, -4) \cup (-4, 4) \cup (4, \infty)$

7. $h(x) = \dfrac{2x}{x^2 - 4}$ $x \neq -2, 2$ $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

8. $h(x) = \sqrt{3x - 12}$ $x \geq 4$ $[4, \infty)$

9. $f(x) = \sqrt{1 - x}$ $x \leq 1$ $(-\infty, 1]$

10. $g(x) = \dfrac{3x}{x^2 - 4}$ Same as #7

11. $f(x)=\frac{x}{x-4}$ $x\neq 4$

$(-\infty,4)\cup(4,\infty)$

12. $q(x)=\sqrt{-x-2}$

$x\leq -2$ $(-\infty,-2]$

13. $f(x)=\frac{3x^2-x+7}{x^2+2x-3}$

$x\neq -3$ $x\neq 1$

$(-\infty,-3)\cup(-3,1)\cup(1,\infty)$

14. $g(x)=\sqrt{x}+5$ $x\geq 0$

$[0,\infty)$

15. $g(x)=\sqrt{x^2+6x+8}$

$(-\infty,-4]\cup[-2,\infty)$

16. $g(x)=\frac{3}{\sqrt{x^2-8x+15}}$

$(-\infty,3)\cup(5,\infty)$

In problems 15-22, determine if the graph is that of a function by using the vertical-line test. If it is, Use the graph to find: (a) its domain and range

15.

D: $[-3,\infty)$

R: $[0,\infty)$

16.

D: $[0,4]$

R: $[0,3]$

17. Not a function

18.

D: $(-\infty,\infty)$

R: $(0,\infty)$

19. Not a function

20.

D: $(-\infty,\infty)$

R: $(-\infty,2]$

21.

D: $(0,\infty)$

R: $(-\infty,\infty)$

22.

D: $(-\infty,\infty)$

R: $[-3,\infty)$

23.

D: $(-\infty,\infty)$

R: $(-\infty,5]$