Name _____ Honors PreCalc P-Set

Functions and Their Graphs _____ / **10**

Determine if the relation represents a function. For those that are, state the domain and range.

1. $\{(-3,9), (-2,4), (-1,1), (0,0), (1,1), (2,4), (3,9)\}$

2. $\{(-3,0), (1,6), (2,-3), (4,2), (-5,6), (4,-9), (6,2)\}$

Determine if each represent y as a function of x.

3. $y = x^3 - x$

4. $x^2 - y^2 = 1$

5. $x = 4$

6. $y = x^2 + 4$

Find an expression for $f(x)$ of each given the function's description.

7. (1) add 3; (2) multiply by 2; (3) divide by 4

8. (1) subtract 5; (2) take the square root; (3) multiply by -1

9. (1) multiply by -1; (2) take the square root; (3) subtract 5

Given $f(x) = 2x^2 - 5$, simplify or evaluate each.

10. $f(3)$

11. $f(0)$

12. $f(-2)$

13. $f(2x)$

14. $f(-x)$

15. $f(x+1)$

Find the domain of each. Write your answers in interval notation.

16. $f(x) = x^2 + 4$

17. $f(x) = \dfrac{x-2}{x+1}$

18. $f(x) = \dfrac{3x}{x^2+x-2}$

19. $f(x) = \sqrt{2x+5}$

20. $f(x) = \sqrt[3]{6x-2}$

21. $f(x) = \dfrac{\sqrt{6x-2}}{x^2-36}$

Find the intercepts (both x- and y-) of each.

22. $y = x^2 + 1$

23. $y = \sqrt{x-2}$

24. $y = x^2 - 2x - 8$

Key

1. Yes. Domain: $\{-3, -2, -1, 0, 1, 2, 3\}$. Range $= \{9, 4, 1, 0\}$
2. Not a function.
3. Yes.
4. No.
5. No.
6. Yes.
7. $f(x) = \frac{2(x+3)}{4} = \frac{2x+6}{4}$
8. $f(x) = -\sqrt{x-5}$
9. $f(x) = \sqrt{-x} - 5$
10. 13
11. -5
12. 3
13. $8x^2 - 5$
14. $2x^2 - 5$
15. $2x^2 + 4x - 3$
16. $(-\infty, \infty)$
17. $(-\infty, -1) \cup (-1, \infty)$
18. $(-\infty, -2) \cup (-2, 1) \cup (1, \infty)$
19. $\left[-\frac{5}{2}, \infty\right)$
20. $(-\infty, \infty)$
21. $\left[\frac{1}{3}, 6\right) \cup (6, \infty)$
22. No x-intercepts; y-intercept: $(0, 1)$
23. x-intercept: $(2, 0)$; No y-intercept
24. x-intercepts: $(4, 0)$ and $(-2, 0)$; y-intercept: $(0, -8)$