NAME Key DATE _____ SCORE _____

Functions

Evaluate each of the following functions at $x = -2$.

1. $f(x) = 3x + 1$ -5
2. $g(x) = 3x^2$ 12
3. $s(x) = x - |x|$ -4
4. $r(x) = \frac{x - 5}{x^2}$ $-\frac{7}{4}$
5. $y(y(x))$, where $y(x) = x^2 - 1$ 8
6. $t(x) = 3x^2 + 5x + 3$ 5

Give the domain of each function.

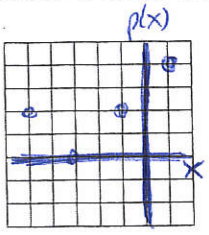
7. $a(x) = 5x - 1$ $\{$all real #s$\}$
8. $k(x) = |x|$ $\{$all real #s$\}$
9. $c(x) = \frac{5}{x - 3}$ $\{x : x \neq 3\}$
10. $m(x) = \sqrt{3x}$ $\{x : x \geq 0\}$
11. $e(x) = \frac{3x}{(x - 1)(x - 2)}$ $\{x : x \neq 1, 2\}$
12. $b(x) = \sqrt{2x + 6}$ $\{x : x \geq -3\}$

Give the range of each function with the given domain.

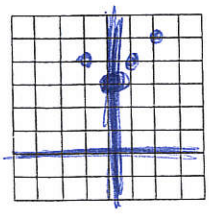
13. $d(x) = 5 - 2x$, $D = \{-1, 0, 1\}$ $\{3, 5, 7\}$
14. $h(x) = 2x^2 + 1$, $D = \{0, 1, 2\}$ $\{1, 3, 9\}$
15. $j(x) = x^3$, $D = \{-2, -1, 0, 1\}$ $\{-8, -1, 0, 1\}$
16. $n(x) = \sqrt{x}$, $D = \{0, 1, 4, 9\}$ $\{0, 1, 2, 3\}$
17. $u(x) = x^4$, $D = \{-2, -1, 0, 1\}$ $\{0, 1, 16\}$
18. $p(x) = |x + 3|$, $D = \{-5, -3, -1, 1\}$ $\{0, 2, 4\}$
19. $w(y) = |y| + 3$, $D = \{-1, 0, 1, 2\}$ $\{3, 4, 5\}$
20. $z(c) = 3c^2 - 5c + 2$, $D = \{-1, 0, 1, 2\}$ $\{0, 2, 4, 10\}$

Graph the functions p and w from items 18 and 19 above.

21. Graph of function p from item 18



22. Graph of function w from item 19



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Linear Functions

Find an equation of the linear function with the following slope and function value.

1. $m = 3, f(1) = 5$ $f(x) = 3x + 2$
2. $m = 5, g(0) = 0$ $g(x) = 5x$
3. $m = 0, h(3) = 7$ $h(x) = 7$
4. $m = \frac{1}{2}, r(4) = 0$ $r(x) = \frac{1}{2}x - 2$
5. $m = \frac{3}{5}, s(5) = 4$ $s(x) = \frac{3}{5}x + 1$
6. $m = \frac{2}{3}, t(1) = 1$ $t(x) = \frac{2}{3}x + \frac{1}{3}$
7. $m = -\frac{1}{4}, a(4) = 0$ $a(x) = -\frac{1}{4}x + 1$
8. $m = -\frac{2}{3}, f(-6) = -1$ $f(x) = -\frac{2}{3}x - 5$

Find the third value, given two values for each linear function.

9. $f(1) = -1; f(3) = 3; f(-1) =$? -5
10. $g(-1) = 7; g(2) = 1; g(-2) =$? 9
11. $h(0) = -1; h(5) = 1; h(-5) =$? -3
12. $r(3) = 9; r(\frac{1}{2}) = 9; r(-1) =$? 9

Solve the following. Assume that each relationship is linear.

13. Complete fossils have shown that certain plants with 2 mm wide stems were 36 mm tall, while plants with 3 mm stems were 51 mm tall. If a fragment of a plant is found with a 5 mm wide stem, how tall would you expect the plant to be? 81 mm

14. When 30 students were asked about attending a school concert, 20 said they would go. From a different group of 45 students, 25 responded positively. How many will probably attend the concert if the total school population is 1170? 400 students

15. When Tony worked for the Dombroske family, he earned \$11.00 for a 3-hour job, and \$17.00 for a 5-hour job. How much will he earn for a 6-hour job? \$20