

Unit 1 Functions & Their Inverses TEST REVIEW

Place the answer to each of the following questions below the question. MUST SHOW WORK on a SEPARATE SHEET of PAPER. NO WORK = NO CREDIT!

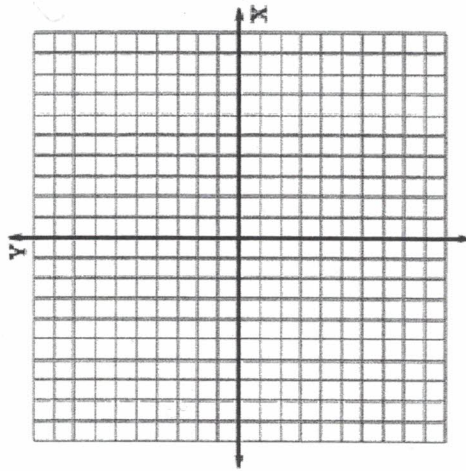
- During a particular year, the taxes owed by a married person filing separately with an adjusted gross income of x dollars is given by the piecewise function below:

$$T(x) = \begin{cases} 0.15x & \text{if } 0 \leq x < 17,900 \\ 0.28(x - 17,900) + 2685 & \text{if } 17,900 \leq x < 43,250 \\ 0.31(x - 43,250) + 9783 & \text{if } x \geq 43,250 \end{cases}$$

Find and interpret: $T(39,000) + T(15,000)$

Couple should have paid taxes on \$10,843.

- Graph the following system of inequalities:
$$\begin{cases} x - y < 1 \\ x + 2y \geq 4 \end{cases}$$

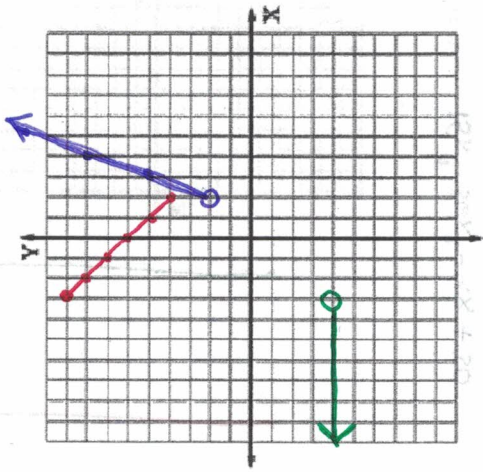


- Graph the piecewise function:

$$f(x) = \begin{cases} -4 & \text{if } x < -3 \\ 6 - x & \text{if } -3 \leq x \leq 2 \\ 3x - 4 & \text{if } x > 2 \end{cases}$$

Drive the table

X	Y
-6	-4
-5	-4
-4	-4
-3	-4
-3	6 - (-3)
-2	6 - (-2)
-1	6 - (-1)
0	
-2	
2	3(2) - 4
3	3(3) - 4
4	3(4) - 4
5	3(5) - 4



4. $-7|3x - 8| + 10 = -39$

{2, 5}

- Find the value of $\frac{f(-1)}{g(4)}$ for the following functions.

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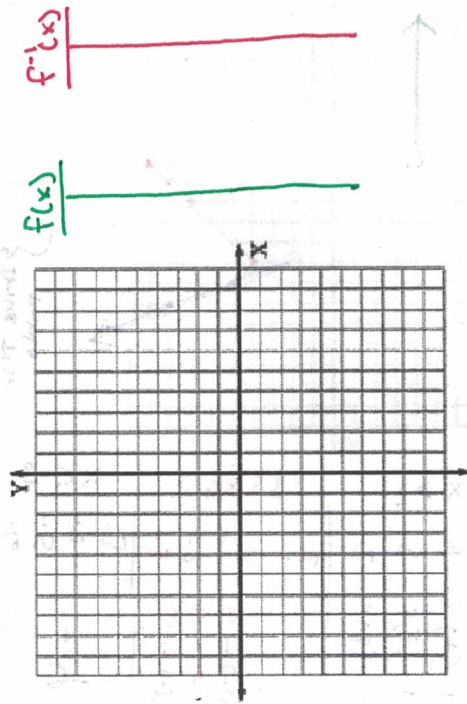
$$\begin{aligned} f(x) &= 4x - 2 \\ g(x) &= -2x + 1 \end{aligned}$$

- If $f(x) = 4 + \sqrt{x - 5}$, then what does $f^{-1}(12)$ equal?

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7. Graph the function $f(x) = \frac{1}{3}x - 1$ and its inverse on the same plane.



8. Find $(f \circ g)(x)$ for the following functions. $15x^3 - 36x^2 - 9x + 30$

$$f(x) = 5x^2 - 7x - 10$$

$$g(x) = 3x - 3$$

$$9. 3 - 2|6 - 2x| = 3 \quad \{3\}$$

10. A manufacture has a 0.3 oz tolerance for a bottle of salad dressing advertised as 14 oz. Solve an absolute value inequality that describes the acceptable volumes for '14 oz' bottles. $[13.7, 14.3]$

11. Find the inverse of the given relation.: $\{(8, -12), (-6, 7), (8, -4)\}$

12. The function $f(x)$ contains the point $(5, -7)$, which point is contained in $f^{-1}(x)$?

13. $y < |x - 5| + 1$
Graph!

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$$14. 10 - 5|9 + x| > 20 \quad \emptyset$$

$$15. 10|2x + 6| + 2 > 102 \quad (-\infty, -8) \cup (2, \infty)$$

16. Find the inverse of the given function.

$$f(x) = \frac{2x - 15}{4}$$

$$f^{-1}(x) = \frac{4x + 15}{2}$$

17. Find $(f \circ g)(x)$ for the following functions.

$$f(x) = 15x + 16$$

$$g(x) = -13x^2 + 2x + 34$$

$$13x^2 + 13x - 18$$

$$18. 4 - 3|x + 2| = 16 \quad \emptyset$$

19. Find $(f + g)(x)$ for the following functions.

$$f(x) = 4x^2 + 2x + 6$$

$$g(x) = 1x + 10$$

$$4x^2 + 3x + 16$$

$$20. 2|2w - 3| + 1 < 15 \quad (-2, 5)$$