

Show all work and justify all answers or credit might not be awarded.

1. **(5 points)** Find the real solutions of $\sqrt{8x + 48} = 2$.

Answer: _____

2. **(5 points)** Solve the inequality and express your answer using set notation or interval notation:

$$|2x - 1| < 3$$

Answer: _____

3. **(5 points)** Find the equation in slope-intercept form for the line that contains a point (1,2) and is parallel to the line $2x + 4y = 1$.

Answer: _____

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4. **(5 points)** If $f(x) = \begin{cases} x + 2 & \text{if } x \leq 1 \\ (x - 2)^2 & \text{if } 1 < x < 5 \end{cases}$, determine

a. The domain of $f(x)$

Answer: _____

b. $f(3) - f(-3)$

Answer: _____

5. **(5 points)** $x = 2$ is a zero of the polynomial $p(x) = x^3 - 5x^2 + 2x + 8$. Find all remaining zeros of $p(x)$.

Answer: _____

6. **(5 points)** Find the center (h,k) and the radius of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$.

Answer: _____

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7. **(5 points)** Solve the equation $\log_4(x+4) + \log_4(2x+1) = 1$.

Answer: _____

8. **(5 points)** Find the inverse function of $f(x) = \frac{1}{x-2}$.

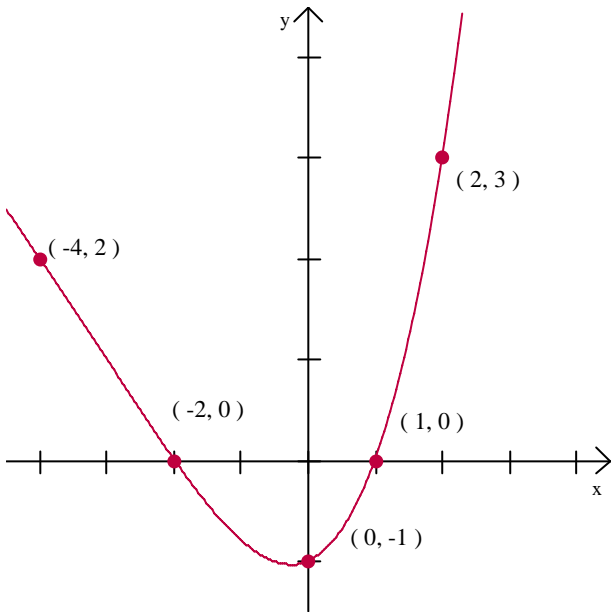
Answer: _____

9. **(5 points)** Solve the equation $5^{-2x+1} = 3$

Answer: _____

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10. (5 points) Use the graph of f given below on the left to answer the questions below on the right.



a. Find $f(2)$.

Answer: _____

b. For what numbers x is $f(x) < 0$?

Answer: _____

11. (5 points) For the functions $f(x) = 3x^2 + 8$ and $g(x) = \sqrt{7x - 2}$,

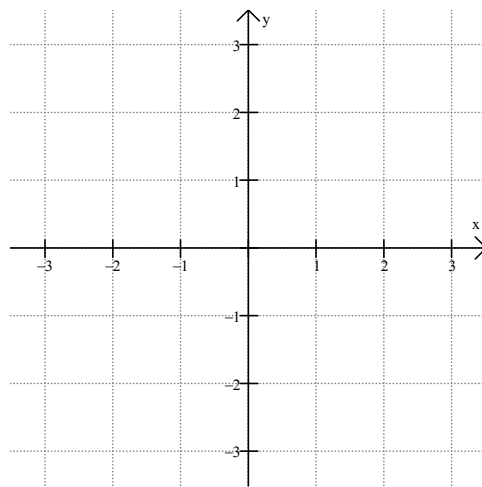
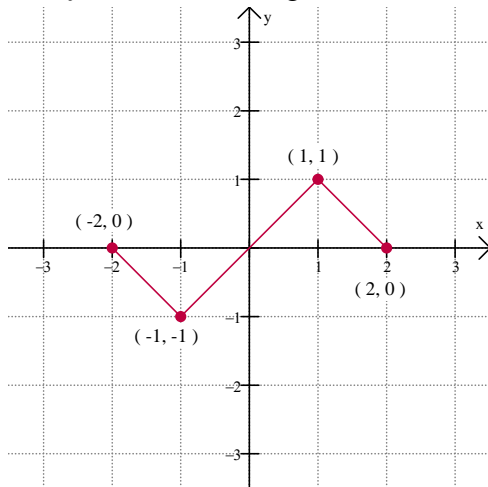
a. Find and simplify a formula for $f \circ g$.

Answer: _____

b. Determine the domain of this composite function.

Answer: _____

12. (5 points) The graph of f appears below on the left. Use the graph of f as the first step toward graphing $F(x) = 2f(x+1)$ on the right.



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13. (5 points) Find the domain of $f(x) = \frac{x+3}{x^3-4x}$.

Answer: _____

14. (5 points) Solve the inequality and express your answer using set notation or interval notation. $\frac{(x-2)(x+2)}{x-1} > 0$

Answer: _____

15. (5 points) 1000 dollars is deposited in a bank with 5% interest rate per annum. How much will the asset be for two years if compounded yearly?

Answer: _____

16. (5 points) Suppose that the functions f and g are defined by the tables below on the left. Evaluate each expression below on the right by using the values in the table.

x	-1	0	1	2	3
f(x)	3	2	3	-2	-1
g(x)	2	3	-1	4	0

a. $(f \circ g)(-1)$

Answer: _____

b. $(f \circ f)(-1)$

Answer: _____

c. $(g \circ f)(0)$

Answer: _____

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17. **(5 points)** Given the function $f(x) = x^2 - 4$ Find the quotient $\frac{f(1+h) - f(1)}{h}$, for $h \neq 0$. Be sure to simplify the result.

Answer: _____

18. **(5 points)** Solve the inequality $1 < 2x - 3 < 4$ and express your answer using set notation or interval notation.

Answer: _____

19. **(5 points)** Determine whether the quadratic function $f(x) = -2x^2 + 12x - 16$ has a maximum value or a minimum value. Then find the value.

Answer: _____

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20. **(5 points)** A rectangle is to be constructed so that its perimeter is 34 meters, and its area is 70 square meters. Find the dimensions of the rectangle.

Answer: _____