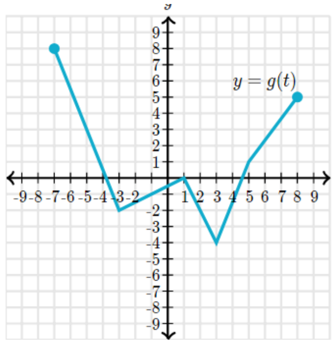
Pre-Calculus Chapter 1 Review Name ___________________________

Determine the domain and range of the graphs. Write answers in interval notation.

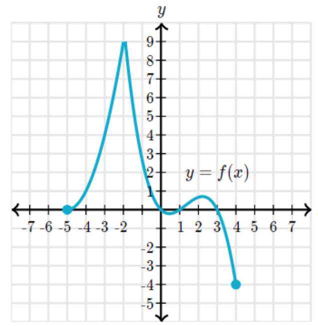
1. D: [-7, 8]
R: [-4, 8]

2. D: [-5, 4]
R: [-4, 9]

1. Graph:



2. Graph:

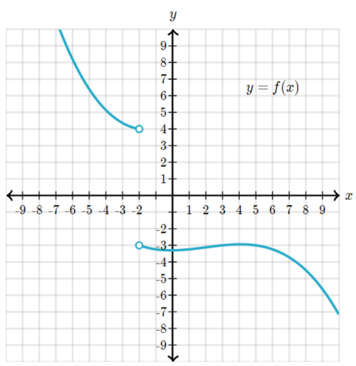


Determine if there is a point of discontinuity and if it is removable or nonremovable or jump.

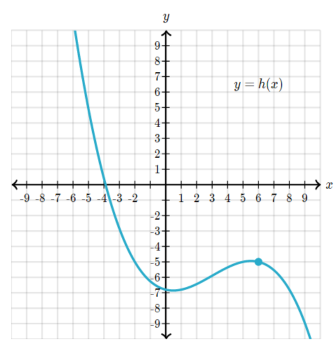
3. discont - jump

4. cont

3. Is this graph continuous at x = -2?
If not, what type of discontinuity does it have?



4. Is the graph continuous at x = 6
If not, what type of discontinuity does it have?



State the following, write the max/min in ordered pair form, write the increasing/decreasing in interval notation.

(1, 37) 5. Local maximum

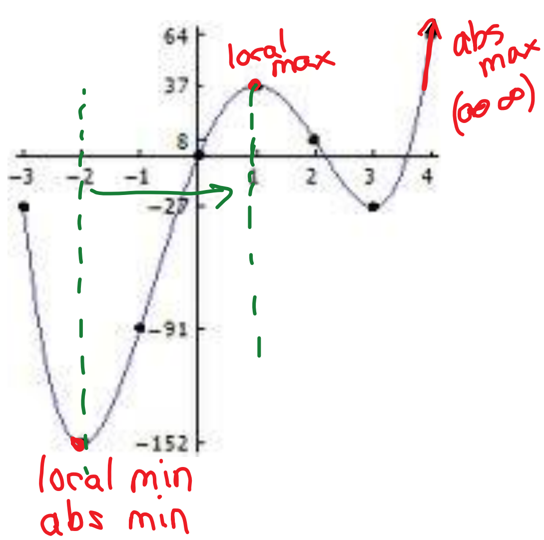
(-2, -152) 6. Local minimum

(∞ , ∞) 7. Absolute maximum

(-2, -152) 8. Absolute minimum

(-2, 1) ∪ (3, ∞) 9. Interval(s) of increasing

(-3, -2) ∪ (1, 3) 10. Interval(s) of decreasing



Building functions. Find the following for the given functions: $f(x) = x^2 - 3x + 4$ $g(x) = 3x^2 + 5x - 7$ $h(x) = 2x + 5$

$4x^2 + 2x - 3$ 11. $(f + g)(x)$ $(x^2 - 3x + 4) + (3x^2 + 5x - 7)$

$-2x^2 - 8x + 11$ 12. $(f - g)(x)$ $(x^2 - 3x + 4) + (-3x^2 - 5x + 7)$

$-x^2 + 5x + 1$ 13. $(h - f)(x)$ $(2x + 5) + (-x^2 + 3x - 4)$

$2x^3 - x^2 - 7x + 20$ 14. $(fh)(x)$ $(x^2 - 3x + 4)(2x + 5) = 2x^3 + 5x^2 - 6x^2 - 15x + 8x + 20$

$\frac{x^2 - 3x + 4}{2x + 5}$ $D = (-\infty, -\frac{5}{2}) \cup (-\frac{5}{2}, \infty)$
15. $(f/h)(x)$ also state the domain for the new function.

$$\frac{x^2 - 3x + 4}{2x + 5 \neq 0}$$
$x \neq -\frac{5}{2}$

3 16. Find $(g \circ f)(-2)$ for $f(x) = x^2 - 1$, $g(x) = 2x - 3$

$2(x^2 - 1) - 3$

$2(-2^2 - 1) - 3 = 3$

$f(-2) = -2^2 - 1 = 3$

$g(3) = 2(3) - 3 = 3$

$6x^2 - 19$ 17. Find $f(g(x))$ given $f(x) = 3x + 2$, $g(x) = 2x^2 - 7$.

$3(2x^2 - 7) + 2$

$6x^2 - 21 + 2$

$f^{-1}(x) = \frac{x-5}{2}$ 18. Find the inverse of the function: $f(x) = 2x + 5$

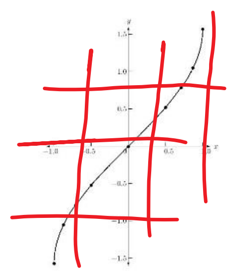
$y = 2x + 5$

$x = 2y + 5$

$x - 5 = 2y$

$\frac{x-5}{2} = y$

yes 19. Determine whether the function is one-to-one.



Show work below   20. Show that f and g are inversed by showing that $f(g(x)) = x$ and $g(f(x)) = x$

$f(x) = \frac{x+3}{4}$ and $g(x) = 4x - 3$

$f(g(x)) = \frac{(4x-3)+3}{4} = \frac{4x}{4} = x$

$g(f(x)) = \cancel{4}\left(\frac{x+3}{\cancel{4}}\right) - 3$

$= x + \cancel{3} - \cancel{3} = x$