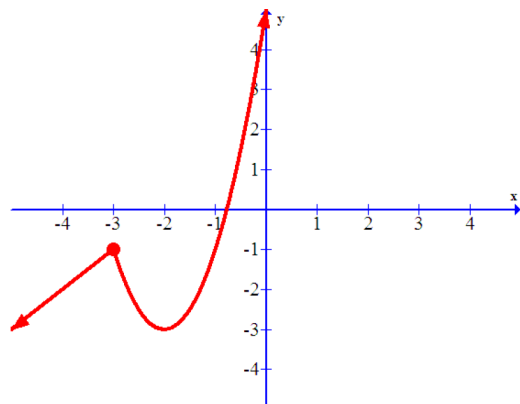


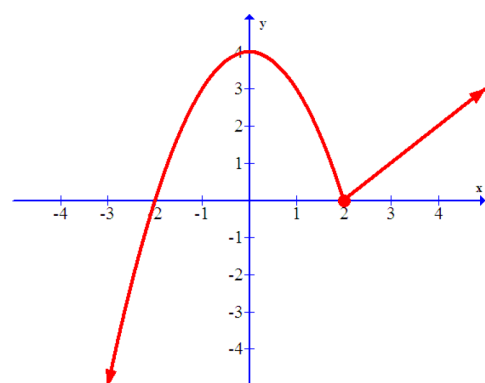
Exercise Set 2.4: Continuity

For each graph given below, find any points of discontinuity and state the reason for the discontinuity.

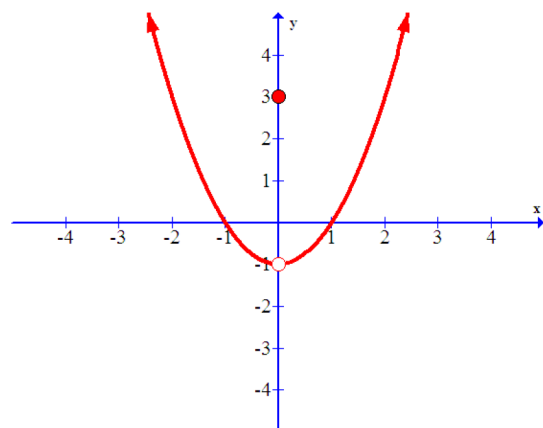
1.



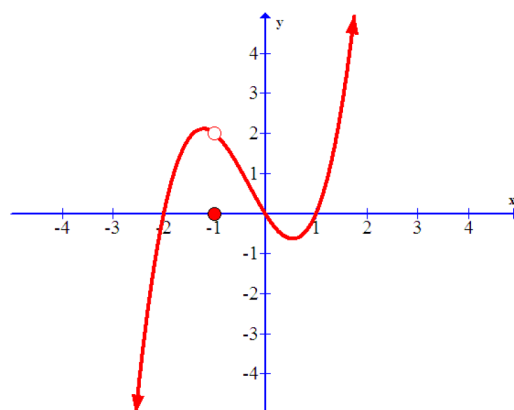
2.



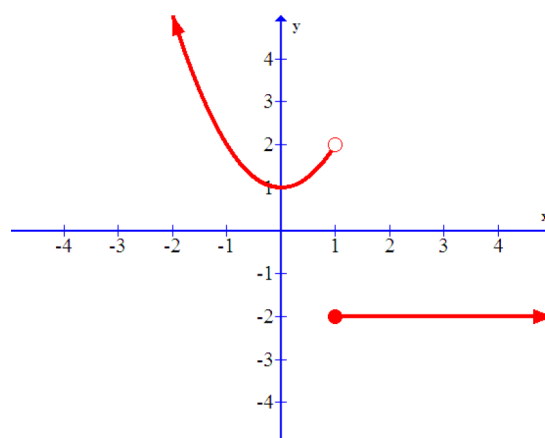
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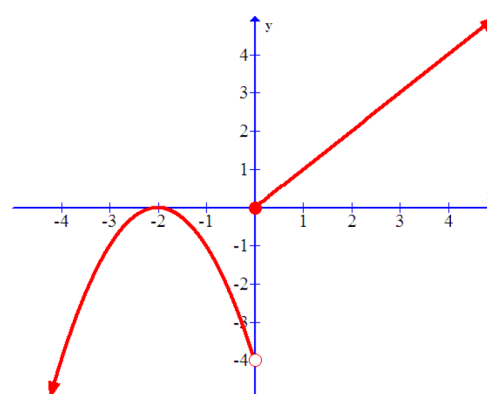
4.



5.

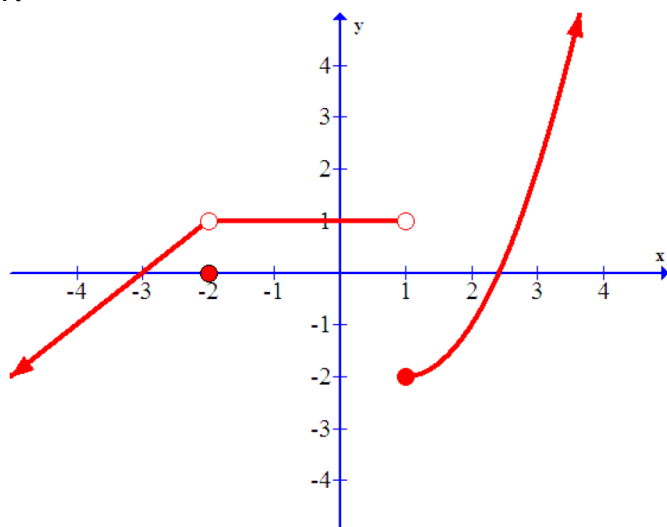


6.

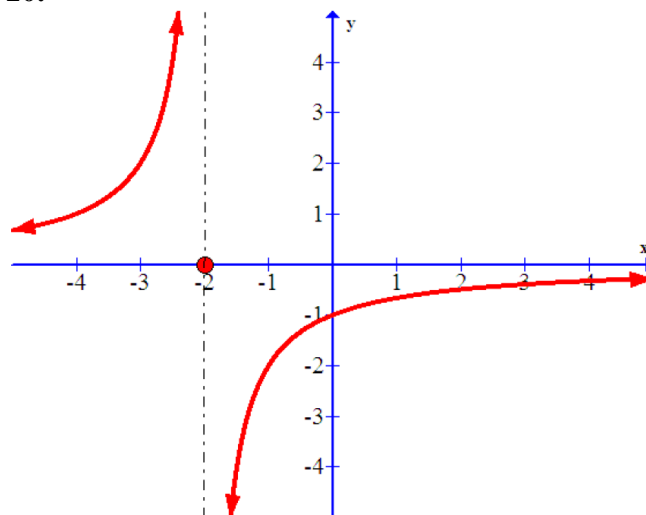


Exercise Set 2.4: Continuity

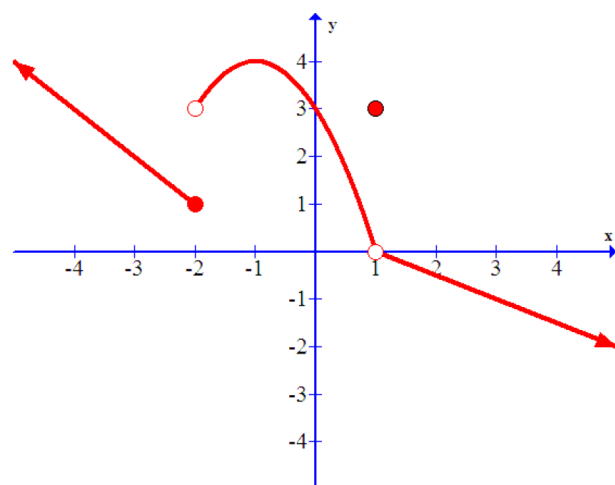
7.



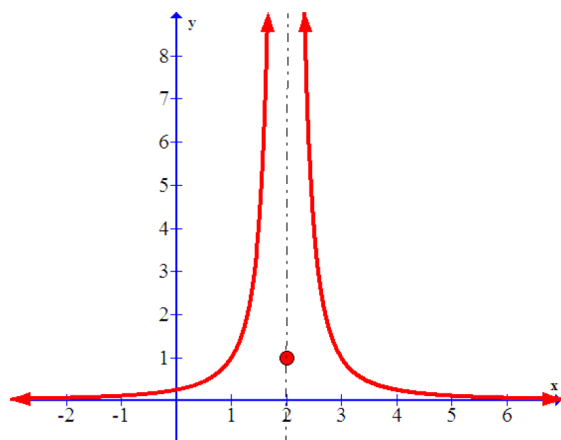
10.



8.



9.



Determine if the function is continuous at the given value for a .

$$11. f(x) = \begin{cases} 2x-1, & x < 0 \\ x^2 + 4x - 1, & x \geq 0 \end{cases}, a = 0$$

$$12. f(x) = \begin{cases} x^2 + 3, & x < -1 \\ 2x + 6, & x \geq -1 \end{cases}, a = -1$$

$$13. f(x) = \begin{cases} x+2, & x < 2 \\ 2, & 2 \leq x \leq 6 \\ 14-2x, & x > 6 \end{cases}, a = 6$$

$$14. f(x) = \begin{cases} x+2, & x < 2 \\ 2, & 2 \leq x \leq 6 \\ 14-2x, & x > 6 \end{cases}, a = 2$$

$$15. f(x) = \begin{cases} x^2 - 3, & x < 0 \\ -3, & 0 \leq x \leq 4 \\ 2x - 5, & x > 4 \end{cases}, a = 4$$

Exercise Set 2.4: Continuity

$$16. f(x) = \begin{cases} x^2 - 3, & x < 0 \\ -3, & 0 \leq x \leq 4, a = 0 \\ 2x - 5, & x > 4 \end{cases}$$

Determine the intervals on which each function is continuous.

$$17. f(x) = \frac{1}{x-3}$$

$$18. f(x) = \frac{2}{(x-1)^2}$$

$$19. f(x) = \frac{x-3}{x^2-9}$$

$$20. f(x) = \frac{x-1}{x^2-4x+3}$$

$$21. f(x) = \frac{2x-1}{x^2-x-6}$$

$$22. f(x) = \frac{x+3}{x^2+3x-10}$$

$$23. f(x) = \begin{cases} x, & x \leq 1 \\ \frac{1}{x}, & x > 1 \end{cases}$$

$$24. f(x) = \begin{cases} 2x-6, & x \leq 3 \\ \frac{2x}{x-1}, & x > 3 \end{cases}$$

$$25. f(x) = \begin{cases} x^2+1, & x \leq 0 \\ 2x-1, & x > 0 \end{cases}$$

$$26. f(x) = \begin{cases} 2x+1, & x \leq -2 \\ x-1, & x > -2 \end{cases}$$

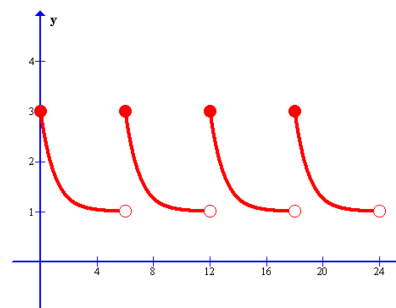
$$27. f(x) = \begin{cases} \frac{x^2-1}{x+1}, & x \neq -1 \\ 2, & x = -1 \end{cases}$$

$$28. f(x) = \begin{cases} \frac{x^2-9}{x-3}, & x \neq 3 \\ 6, & x = 3 \end{cases}$$

$$29. f(x) = \frac{|x|}{x}$$

$$30. f(x) = \frac{x+3}{|x+3|}$$

31. The graph given below shows the amount of medication (in mg) in a person's bloodstream during a 24 hour period. Where is the graph discontinuous? What would account for the discontinuities?



32. The graph below shows the assets (in billions of dollars) of a company during a calendar year. During the year, the company acquired two other companies. Where is the graph discontinuous? What would account for the discontinuities?

