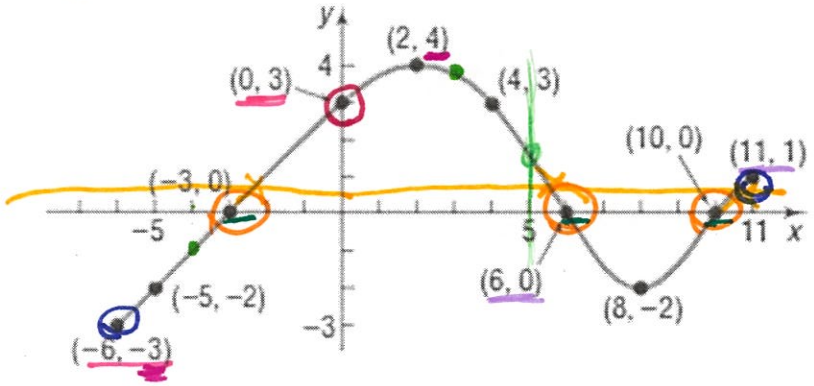
domain – x values
range – y values

Use the given graph of the function f to answer parts (a)–(n).

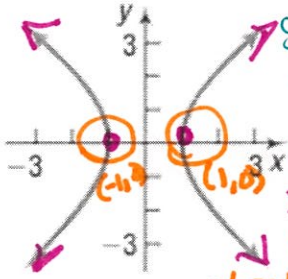


(a) Find $f(0)$ and $f(-6)$. f(0)=3 f(−6)=−3
(b) Find $f(6)$ and $f(11)$. f(6)=0 f(11)=1
(c) Is $f(3)$ positive or negative? positive
(d) Is $f(-4)$ positive or negative? negative
(e) For what values of x is $f(x) = 0$? y=0? −3, 6, 10
(f) For what values of x is $f(x) > 0$? $-3 < x < 6, x > 10$
(g) What is the domain of f? x-values $-6 \le x \le 11$
(h) What is the range of f? y-values $-3 \le y \le 4$
(i) What are the x-intercepts? crosses x-axis x = −3, 6, 10
(j) What is the y-intercept? crosses y-axis y = 3
(k) How often does the line $y = \frac{1}{2}$ intersect the graph? 3 times
(l) How often does the line $x = 5$ intersect the graph? 1 time
(m) For what values of x does $f(x) = 3$? 0, 4
(n) For what values of x does $f(x) = -2$? −5, 8

In Problems 11–22, determine whether the graph is that of a function b

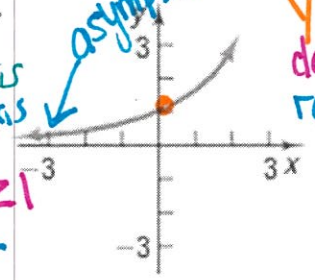
(a) The domain and range
(b) The intercepts, if any
(c) Any symmetry with respect to the x-axis, the y-axis, or the origin

11.



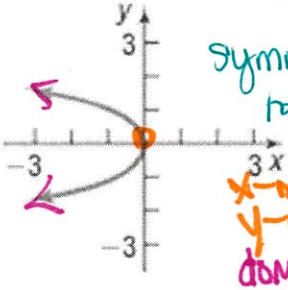
Symmetric to the y-axis and x-axis
domain $x \le -1, x \ge 1$
range ℝ
x-int: −1, 1

12.



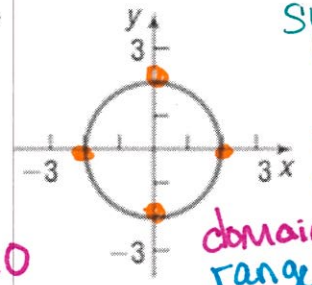
asymptote
y-int: 1
domain: ℝ
range: $y > 0$

15.



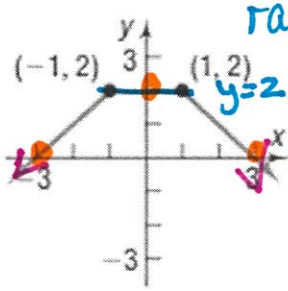
Symmetric to the x-axis
x-int: 0
y-int: 0
domain: $x \le 0$
range: ℝ

16.



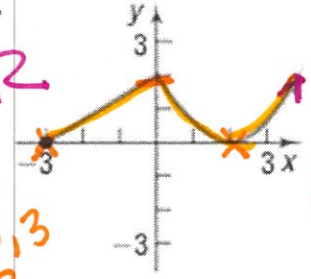
Symmetric to x-axis, y-axis and origin
x-int: −2, 2
y-int: −2, 2
domain: $-2 \le x \le 2$
range: $-2 \le y \le 2$

19.

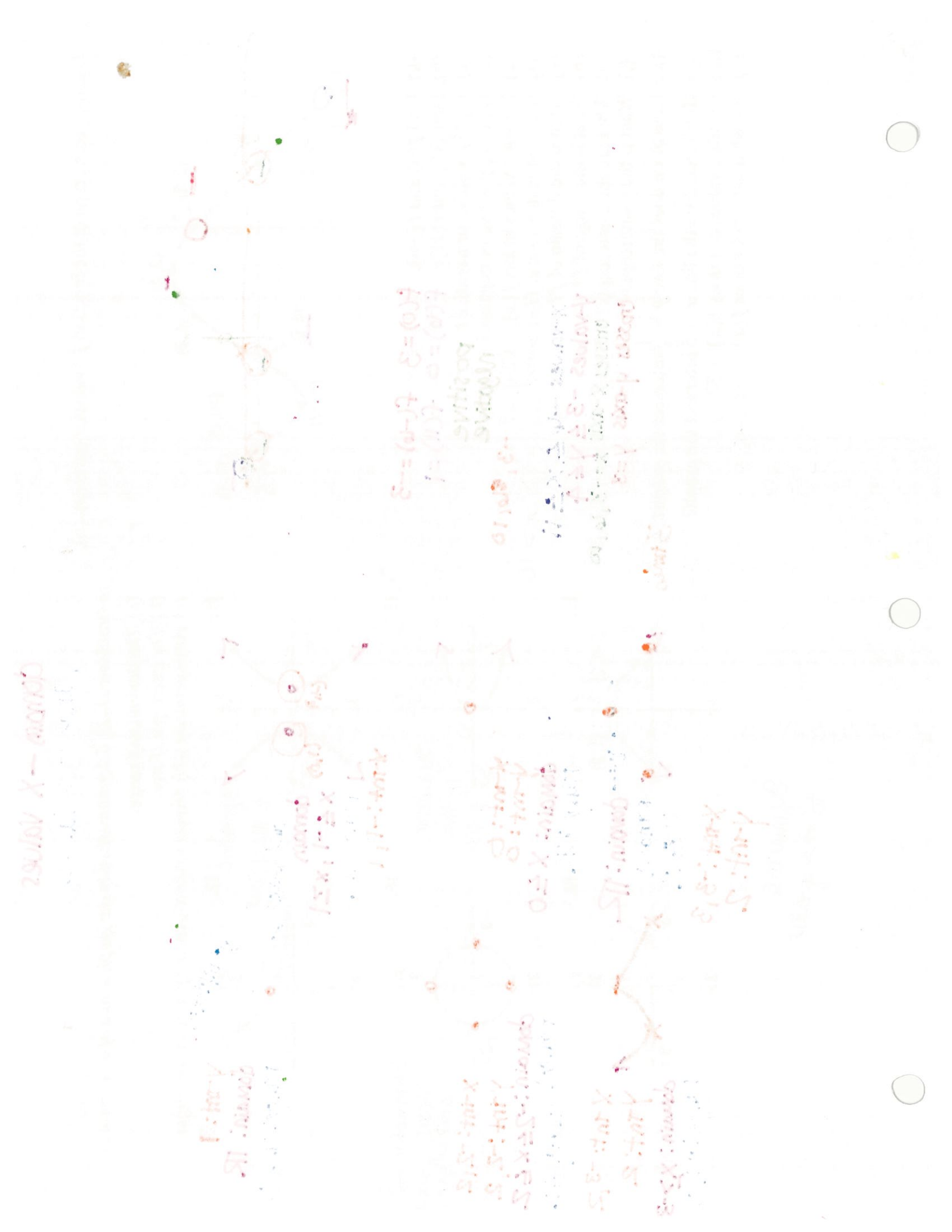


y=2
domain: ℝ
range: $y \le 2$
x-int: −3, 3
y-int: 2
Symmetric to the y-axis

20.



x-int: −3, 2
y-int: 2
domain: $x \ge -3$
range: $y \ge 0$

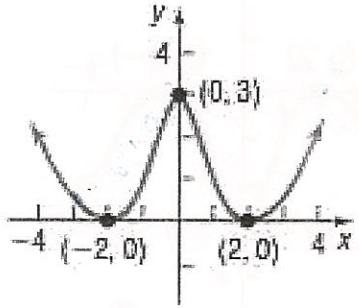


In Problems 29–32, the graph of a function f is given. Use the graph to find:

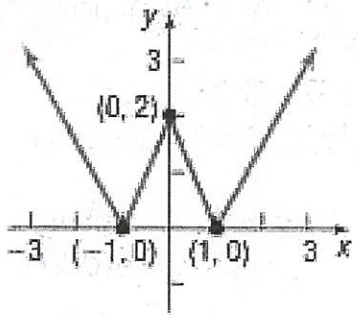
(a) The numbers, if any, at which f has a local maximum value. What are the local maximum values?

(b) The numbers, if any, at which f has a local minimum value. What are the local minimum values?

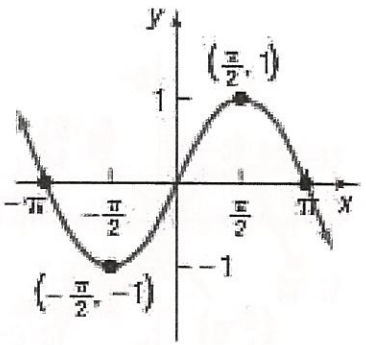
29.



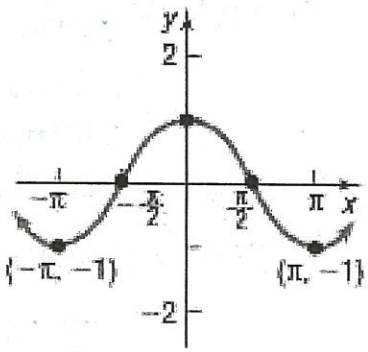
30.



31.

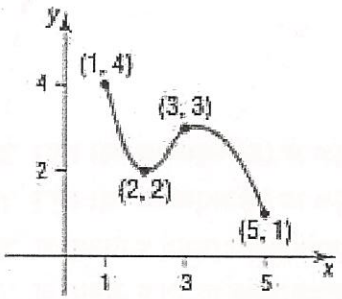


32.



In Problems 45–52, for each graph of a function $y = f(x)$, find the absolute maximum and the absolute minimum, if they exist.

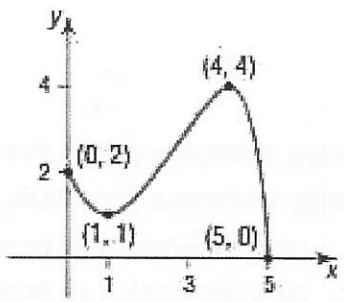
45.



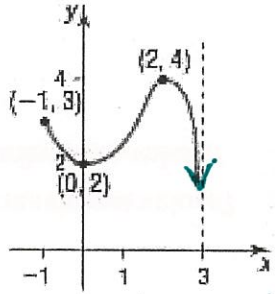
absolute minimum
$f(5) = 1$ lowest y value

absolute maximum
$f(1) = 4$ highest y value

46.



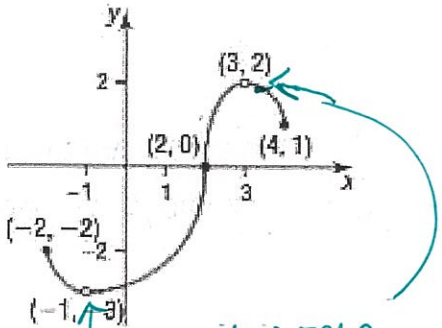
50.



no absolute minimum
(graph continues to negative infinity $-\infty$)

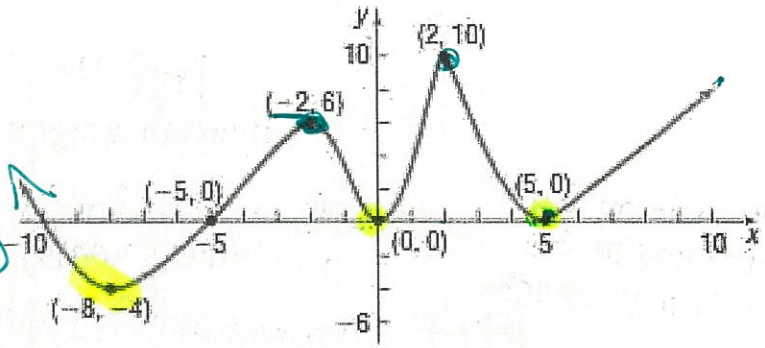
absolute maximum
$f(2) = 4$

51.



since it is open
no absolute minimum
no absolute maximum

In Problems 11–20, use the graph of the function f given.

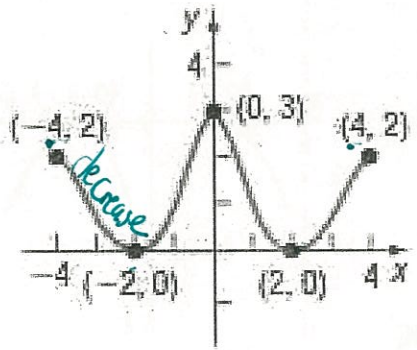


11. Is f increasing on the interval $(-8, -2)$? Yes
12. Is f decreasing on the interval $(-8, -4)$? No
13. Is f increasing on the interval $(2, 10)$?
14. Is f decreasing on the interval $(2, 5)$?
15. List the interval(s) on which f is increasing. $(-8,-2)(0,2)(5,\infty)$
16. List the interval(s) on which f is decreasing. $(-\infty,-8)(-2,0)(2,5)$
17. Is there a local maximum value at 2? If yes, what is it? Yes at 10
18. Is there a local maximum value at 5? If yes, what is it? No
19. List the number(s) at which f has a local maximum. What are the local maximum values? Local max at -2 and 2; 6 and 10
20. List the number(s) at which f has a local minimum. What are the local minimum values? Local min at -8, 0, and 5; -4, 0

In Problems 21–28, the graph of a function is given. Use the graph to find:

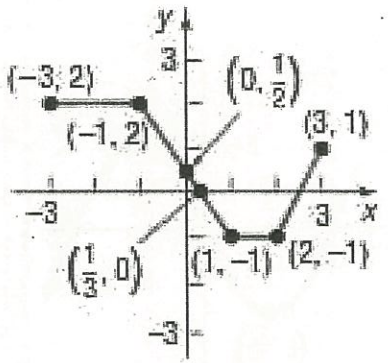
(a) The intercepts, if any
(b) The domain and range
(c) The intervals on which it is increasing, decreasing, or constant
(d) Whether it is even, odd, or neither

21.



x-int: $-2, 2$
y-int: 3
domain: $-4 \le x \le 4$
range: $0 \le y \le 3$
increase: $(-2,0)(2,4)$
$-2 \le x \le 0$ and $2 \le x \le 4$
decreasing: $(-4,-2)(0,2)$
even function

27.



x-int: $\frac{1}{3}$
y-int: $\frac{1}{2}$
domain: $-3 \le x \le 3$
range: $-1 \le y \le 2$
increase: $(2, 3)$
decrease: $(-1, 1)$
Constant: $(-3,-1)(1,2)$
neither