Pre-Calculus Chapter 1 Review Worksheet

1 – 3 Use a graphing calculator to graph the function: $f(x) = x^4 - 2x^2 - 3$

1. Find any relative minimums and maximums.
2. State the x values where f(x) increases and decreases.
3. State the domain and range in interval notation.

4 – 5 Find the following values for each function:

a) f(0) b) f(1) c) f(-x) d) –f(x) e) $\frac{f(x+h)-f(x)}{h}$

4. $f(x) = -3x + 1$

5. $f(x) = 3x^2 + 2x - 4$

6 – 9 Find the domain of each function in set notation.

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

7. $G(x) = \frac{1}{x+4}$

8. $g(x) = -\sqrt{1-x}$

9. $f(x) = \frac{4}{\sqrt{9-x^2}}$

10 - 11 Find the composite function $(f \circ g)(x)$**. State the domain in interval notation.**

10. $f(x) = 3x + 1$, $g(x) = x^2$

11. $f(x) = x^2 + 1$, $g(x) = \sqrt{x-1}$

12 - 13 Verify that each set of functions are inverses.

12. $f(x) = 2x - 6$, $g(x) = \frac{1}{2}(x+6)$

13. $f(x) = \frac{1}{x}$, $g(x) = \frac{1}{x}$

14 - 17 Sketch each of the functions below. Will these functions have an inverse that is a function?

14. $f(x) = -\sqrt{x}$

15. $g(x) = 2 - |x+1|$

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

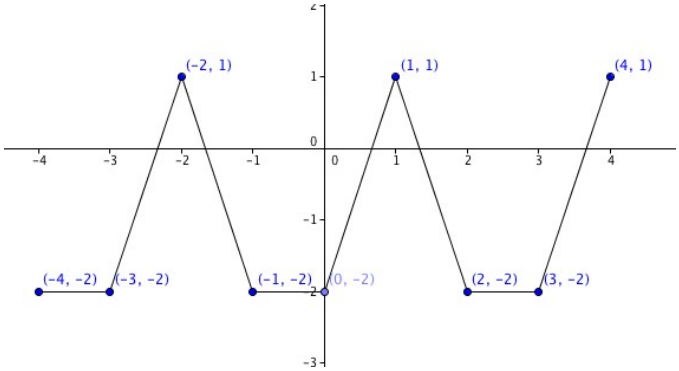
17. $h(x) = \frac{1}{2}[x]$

18 - 19 Sketch each piecewise function below.

18. $f(x)=\begin{cases} x^3, & x<0 \\ 0, & x=0 \\ |x|, & x>0 \end{cases}$

19. $f(x)=\begin{cases} 3, & -5\le x<0 \\ -x^2, & 0\le x\le 2 \\ \sqrt{x-2}, & x>2 \end{cases}$

20 - 23. Use the graph of f(x) shown to answer the following questions.



20 - 23 Sketch the following translations to the graph of f(x) shown above. Do a separate graph for each one.

20. $-3f(x)$

21. $f(x-1)-2$

22. $f(-x)$

23. $f(2x)$

Chapter 1 Review Answers

1. relative minimums: (-1, -4), (1, -4)
relative maximums: (0, -3)

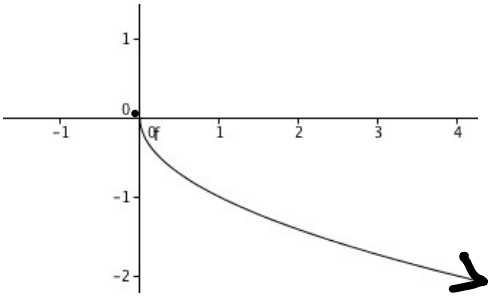
2. increasing $(-1,0)$, $(1,\infty)$
decreasing $(-\infty,-1)$, $(0,1)$

3. D: $(-\infty,\infty)$ R: $[-4,\infty)$

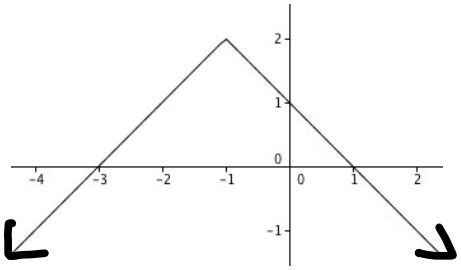
4. a) $f(0)=1$
b) $f(1)=-2$
c) $f(-x)=3x+1$
d) $-f(x)=3x-1$
e) $\dfrac{f(x+h)-f(x)}{h}=-3$

5. a) $f(0)=-4$
b) $f(1)=1$
c) $f(-x)=3x^2-2x-4$
d) $-f(x)=-3x^2-2x+4$
e) $\dfrac{f(x+h)-f(x)}{h}=6x+3h+2$

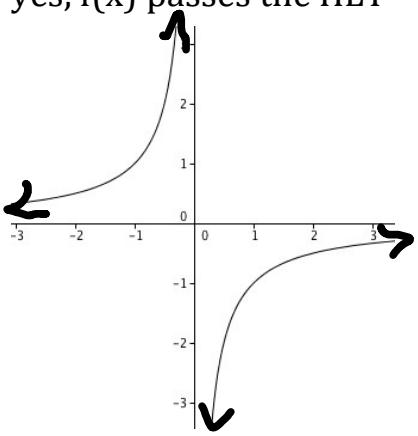
6. $\{x|x\in R\}$
7. $\{x|x\neq -4\}$
8. $\{x|x\leq 1\}$
9. $\{x|-3<x<3\}$
10. $(f\circ g)(x)=3x^2+1$, $(-\infty,\infty)$
11. $(f\circ g)(x)=x$, $[1,\infty)$
12. yes, $(f\circ g)(x)=x=(g\circ f)(x)$
13. yes, $(f\circ g)(x)=x\ (g\circ f)(x)$
14. yes, f(x) passes the HLT



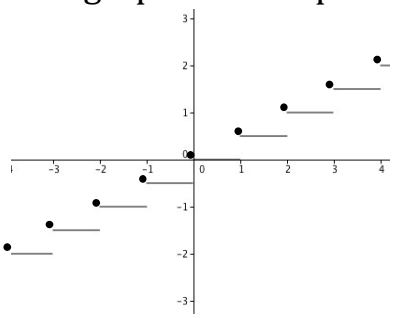
15. no, f(x) fails the HLT



16. yes, f(x) passes the HLT



17. No, f(x) fails the HLT
This graph has an open circle on the right side of each line segment.



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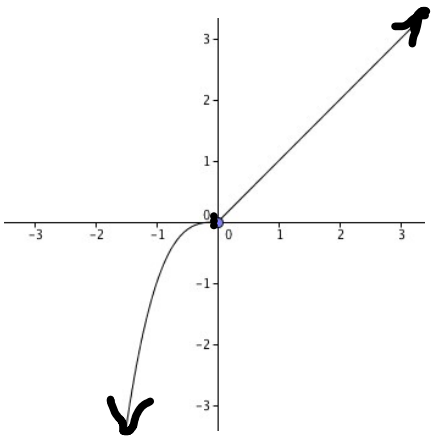
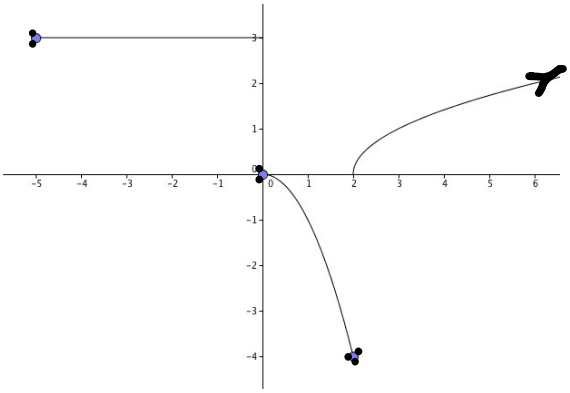


19. There are open circles at (0,3) and (2,0) on this graph.



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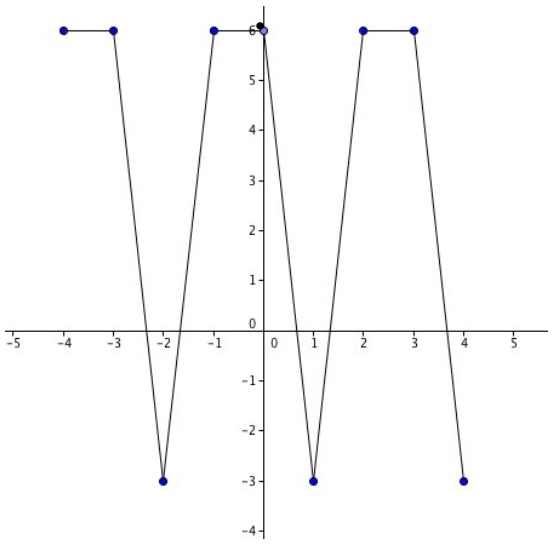

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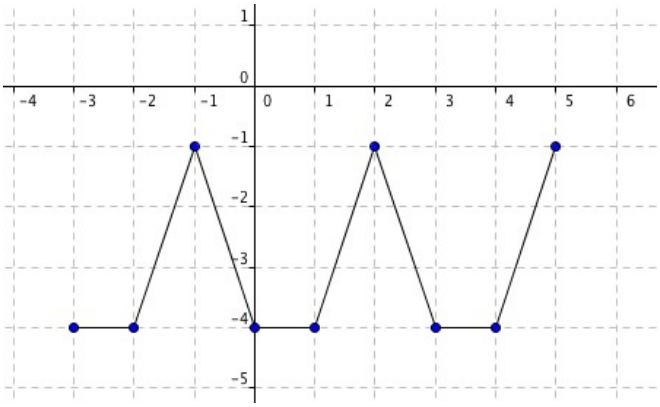

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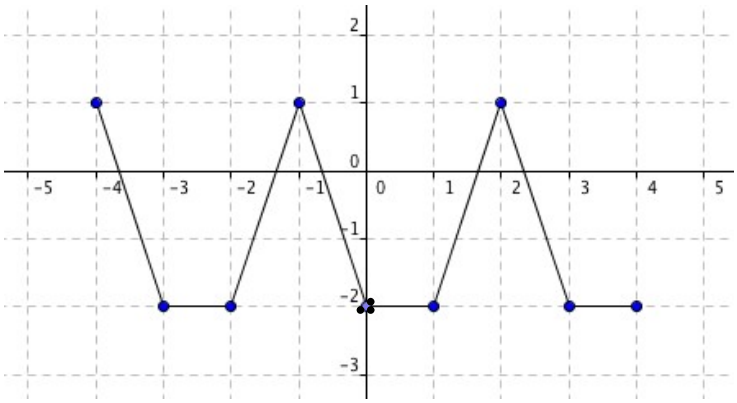

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