

Precalculus: Functions Review WS-1

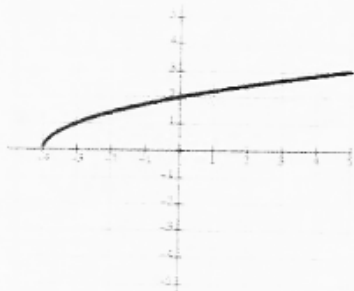
Answer all of the following questions for each of the 6 functions. Be specific on the extrema. Indicate if it's an absolute or relative max or min.

1.



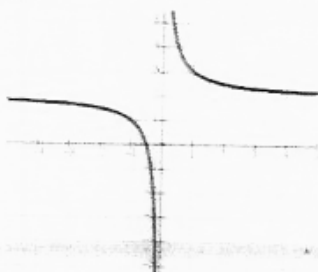
Domain: $(-\infty, \infty)$ extrema: absolute min 3
 Range: $[3, \infty)$ asymptotes: none
 continuity: continuous x-intercepts: none
 boundedness: bounded below y-intercepts: (0, 3)
 increasing: $(0, \infty)$ symmetry (even/odd): even (y-axis)
 decreasing: $(-\infty, 0)$ End behavior:
 $\lim_{x \rightarrow \infty} f(x) = \infty$ $\lim_{x \rightarrow -\infty} f(x) = \infty$

2.



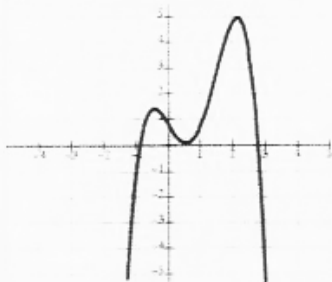
Domain: $[-4, \infty)$ extrema: absolute min 0
 Range: $[0, \infty)$ asymptotes: none
 continuity: continuous x-intercepts: $(-4, 0)$
 boundedness: bounded below y-intercepts: $(0, 2)$
 increasing: $[-4, \infty)$ symmetry (even/odd): neither
 decreasing: never End behavior:
 $\lim_{x \rightarrow \infty} f(x) = \infty$ $\lim_{x \rightarrow -\infty} f(x) = \text{DNE}$

3.



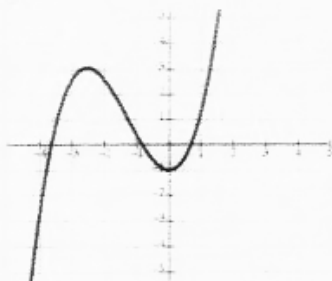
Domain: $(-\infty, 0) \cup (0, \infty)$ extrema: none
 Range: $(-\infty, 2) \cup (2, \infty)$ asymptotes: $y=2$ horizontal, $x=0$ vertical
 continuity: infinite discontinuity x-intercepts: $(-\frac{1}{2}, 0)$
 boundedness: none y-intercepts: none
 increasing: never symmetry (even/odd): neither
 decreasing: $(-\infty, 0) \cup (0, \infty)$ End behavior:
 $\lim_{x \rightarrow \infty} f(x) = 2$ $\lim_{x \rightarrow -\infty} f(x) = 2$

4.

Domain: $(-\infty, \infty)$ extrema: $\begin{matrix} \text{local max } 1.5 \\ \text{absolute max } 5 \end{matrix}$ Range: $(-\infty, 5]$ asymptotes: nonecontinuity: continuousx-intercepts: $(-1, 0)$, $(0, 0)$, $(2.75, 0)$ boundedness: bounded above y-intercepts: $(0, 1)$ increasing: $(-\infty, -1/2) \cup (1/2, 2)$ symmetry (even/odd): neitherdecreasing: $(-1/2, 1/2) \cup (2, \infty)$ End behavior:

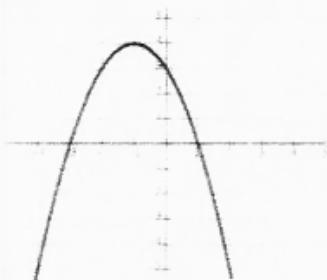
$$\lim_{x \rightarrow \infty} f(x) = -\infty \quad \lim_{x \rightarrow -\infty} f(x) = -\infty$$

5.

Domain: $(-\infty, \infty)$ extrema: $\begin{matrix} \text{local max } 3 \\ \text{local min } -1 \end{matrix}$ Range: $(-\infty, \infty)$ asymptotes: nonecontinuity: continuousx-intercepts: $(-3.75, 0)$, $(-1, 0)$, $(1.75, 0)$ boundedness: noney-intercepts: $(0, -1)$ increasing: $(-\infty, -2.5) \cup (0, \infty)$ symmetry (even/odd): neitherdecreasing: $(-2.5, 0)$ End behavior:

$$\lim_{x \rightarrow \infty} f(x) = \infty \quad \lim_{x \rightarrow -\infty} f(x) = -\infty$$

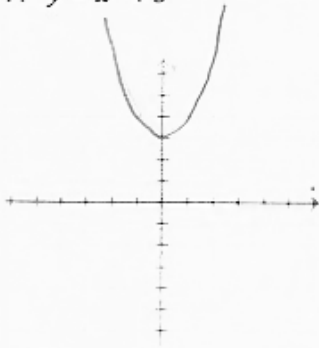
6.

Domain: $(-\infty, \infty)$ extrema: absolute max 4Range: $(-\infty, 4]$ asymptotes: nonecontinuity: continuousx-intercepts: $(-3, 0)$, $(1, 0)$ boundedness: bounded above y-intercepts: $(0, 3)$ increasing: $(-\infty, -1)$ symmetry (even/odd): neitherdecreasing: $(-1, \infty)$ End behavior:

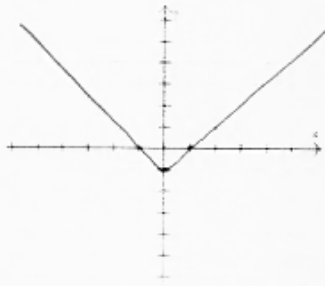
$$\lim_{x \rightarrow \infty} f(x) = -\infty \quad \lim_{x \rightarrow -\infty} f(x) = -\infty$$

Graph the following functions. Make sure your graphs are drawn clearly.

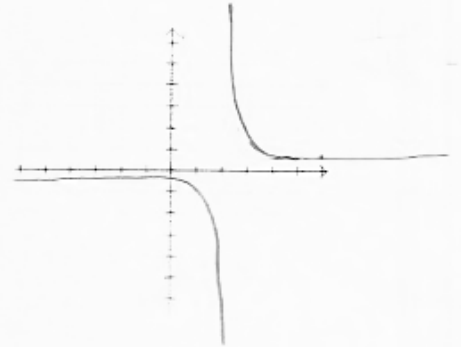
7. $y = x^2 + 3$



8. $y = |-x| - 1$



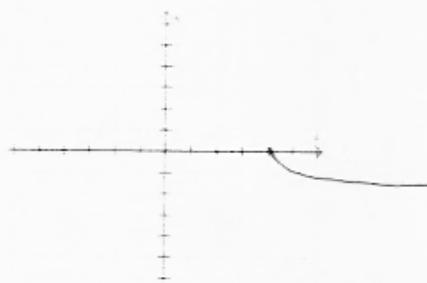
9. $y = \frac{1}{x-2}$



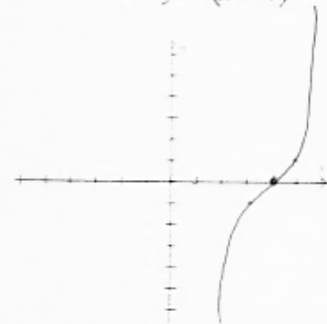
10. $y = -2(x+1)^2 + 3$



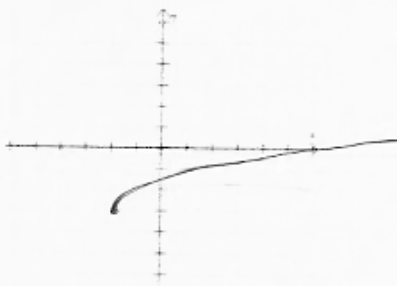
11. $y = -\sqrt{x-4}$



12. $y = (x-4)^3$



13. $y = \sqrt{x+2} - 3$



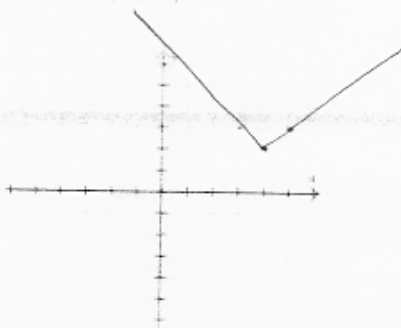
14. $y = (x-2)^3$



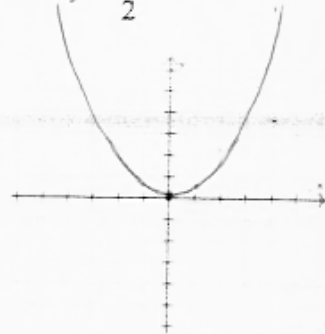
15. $y = 3x + 5$



16. $y = |x-4| + 2$



17. $y = \frac{1}{2}x^2$



18. $y = x^3 + 2$

