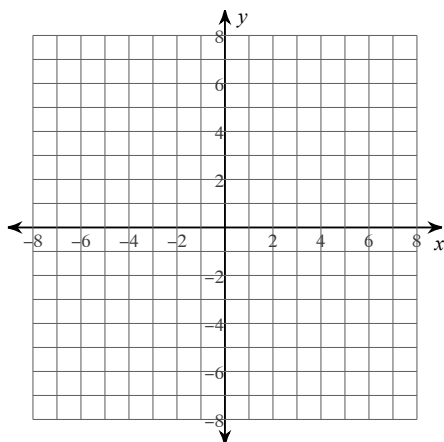


## 9.0 Curve Sketching and Abs Extrema

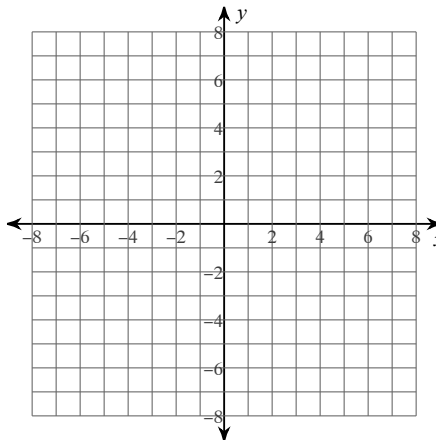
Date \_\_\_\_\_ Period \_\_\_\_\_

For each problem, find all points of absolute minima and maxima on the given interval. You may use the provided graph to sketch the function.

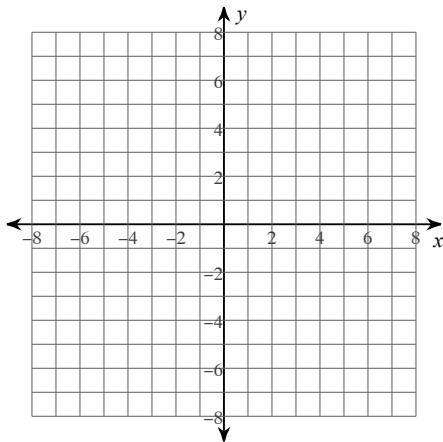
1)  $y = -\frac{4x}{x^2 + 4}; [-5, 0]$



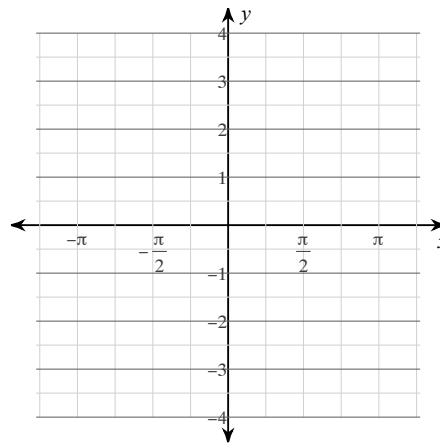
2)  $y = 2x^2 - 1; [-2, 1]$



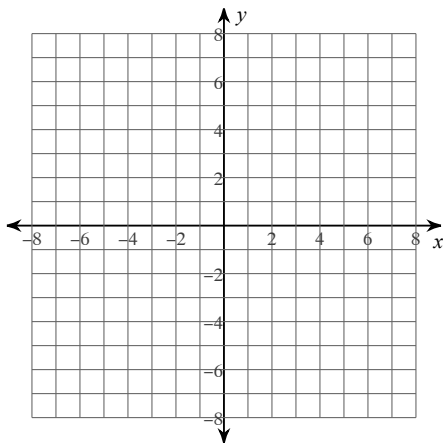
3)  $y = -\frac{x^2}{3x+6}$ ;  $[-6, -3]$



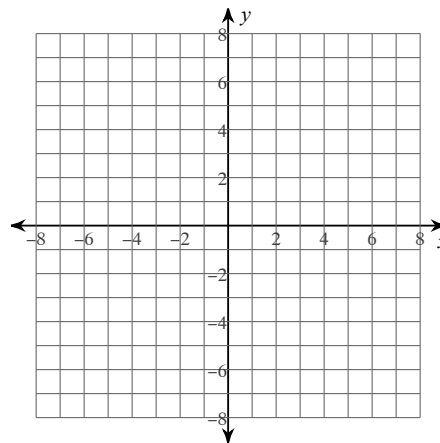
4)  $y = \sin(x)$ ;  $[-\frac{3\pi}{4}, 0]$



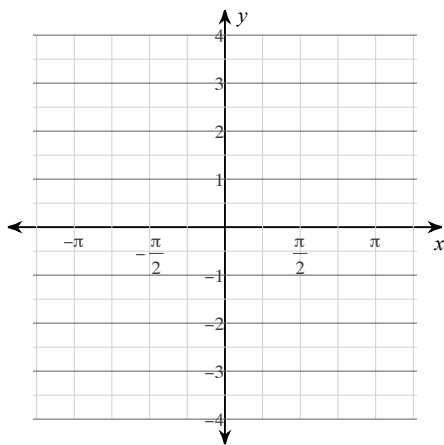
5)  $y = -x^3 + 3x^2$ ;  $[0, 3]$



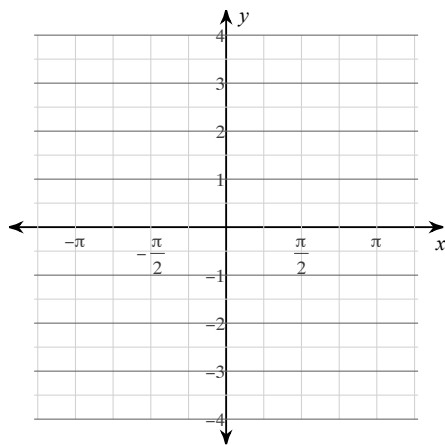
6)  $y = x^2 - 6x + 9$ ;  $[3, 5]$



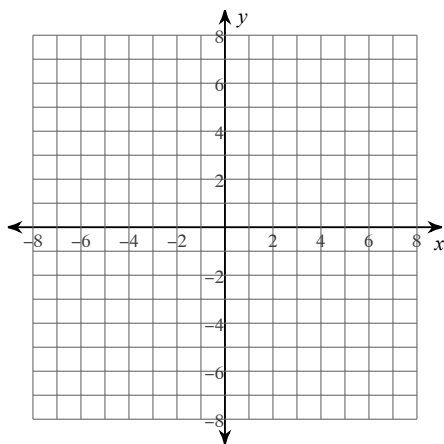
7)  $y = \cot(x)$ ;  $[\frac{\pi}{4}, \frac{\pi}{3}]$



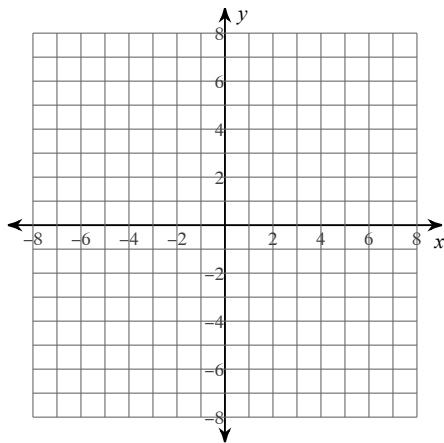
8)  $y = \cot(x)$ ;  $[-\frac{\pi}{2}, -\frac{\pi}{3}]$



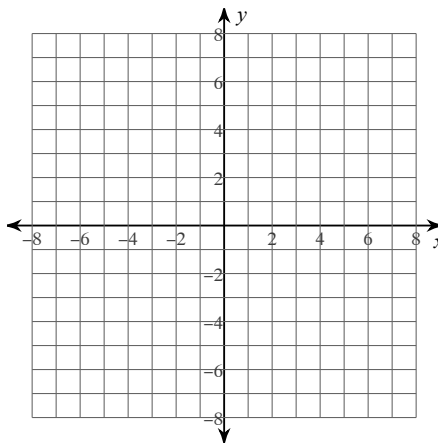
9)  $y = x^4 - 2x^2 + 2$ ;  $[-1, 1]$



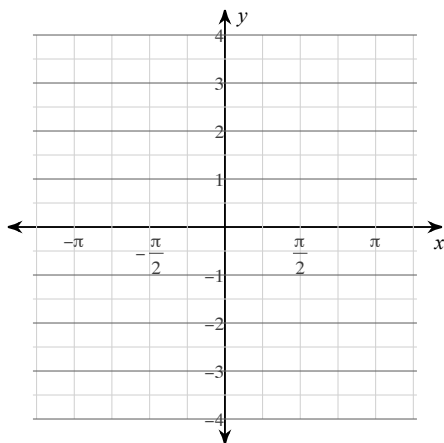
10)  $y = -\frac{x^2}{2} + 1; [-3, 3]$



11)  $y = x^3 - 3x^2; [0, 3]$



12)  $y = \tan(2x); [-\frac{\pi}{2}, \frac{\pi}{2}]$



## Answers to 9.0 Curve Sketching and Abs Extrema (ID: 1)

- 1) Absolute minimum:  $(0, 0)$   
Absolute maximum:  $(-2, 1)$
- 2) Absolute minimum:  $(0, -1)$   
Absolute maximum:  $(-2, 7)$
- 3) Absolute minimum:  $\left(-4, \frac{8}{3}\right)$   
Absolute maxima:  $(-6, 3), (-3, 3)$
- 4) Absolute minimum:  $\left(-\frac{\pi}{2}, -1\right)$   
Absolute maximum:  $(0, 0)$
- 5) Absolute minima:  $(0, 0), (3, 0)$   
Absolute maximum:  $(2, 4)$
- 6) Absolute minimum:  $(3, 0)$   
Absolute maximum:  $(5, 4)$
- 7) Absolute minimum:  $\left(\frac{\pi}{3}, \frac{\sqrt{3}}{3}\right)$   
Absolute maximum:  $\left(\frac{\pi}{4}, 1\right)$
- 8) Absolute minimum:  $\left(-\frac{\pi}{3}, -\frac{\sqrt{3}}{3}\right)$   
Absolute maximum:  $\left(-\frac{\pi}{2}, 0\right)$
- 9) Absolute minima:  $(-1, 1), (1, 1)$   
Absolute maximum:  $(0, 2)$
- 10) Absolute minima:  $\left(-3, -\frac{7}{2}\right), \left(3, -\frac{7}{2}\right)$   
Absolute maximum:  $(0, 1)$
- 11) Absolute minimum:  $(2, -4)$   
Absolute maxima:  $(0, 0), (3, 0)$
- 12) No absolute minima.  
No absolute maxima.