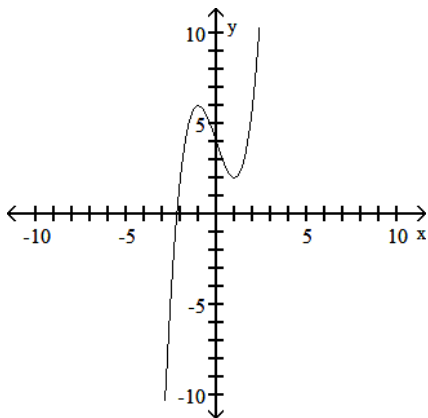


4.4: Concavity and Curve Sketching

Use the graph of the function $f(x)$ to locate the local extrema and identify the intervals where the function is concave up and concave down.

1)

1) _____



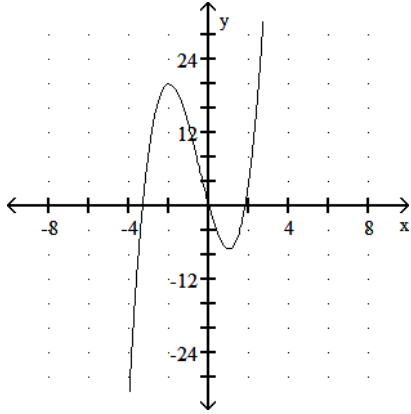
- A) Local minimum at $x = 1$; local maximum at $x = -1$; concave down on $(0, \infty)$; concave up on $(-\infty, 0)$
- B) Local minimum at $x = 1$; local maximum at $x = -1$; concave down on $(-\infty, \infty)$
- C) Local minimum at $x = 1$; local maximum at $x = -1$; concave up on $(-\infty, \infty)$
- D) Local minimum at $x = 1$; local maximum at $x = -1$; concave up on $(0, \infty)$; concave down on $(-\infty, 0)$

Graph the equation. Include the coordinates of any local and absolute extreme points and inflection points.

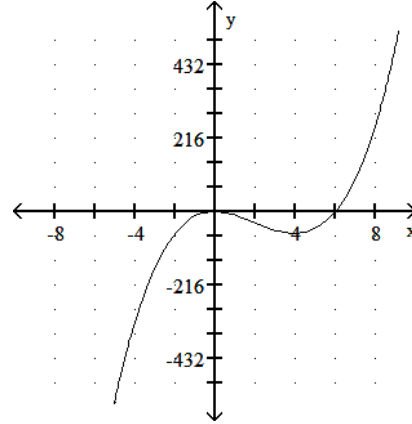
2) $y = 2x^3 + 3x^2 - 12x$

2) _____

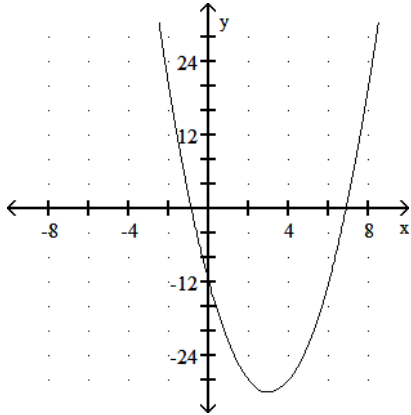
- A) local minimum: $(1, -7)$
 local maximum: $(-2, 20)$
 inflection point: $\left(-\frac{1}{2}, \frac{13}{2}\right)$



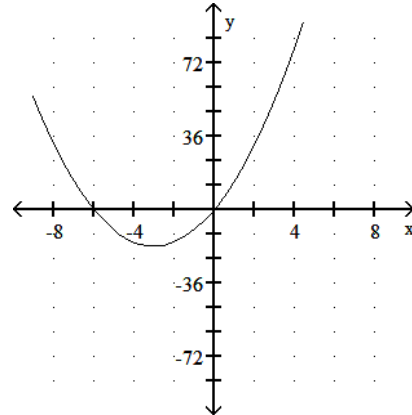
- B) local minimum: $(-4, 64)$
 local maximum: $(0, 0)$
 inflection point: $(-2, 32)$



- C) local minimum: $(3, -30)$
 no inflection point



- D) no extrema
 inflection point: $(0, 0)$

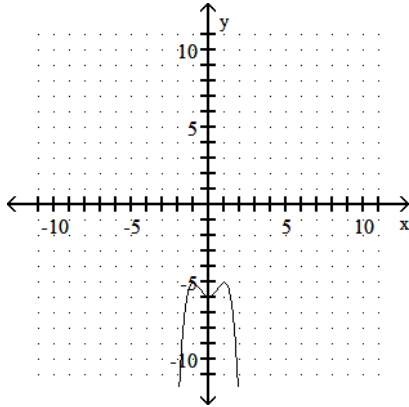


Sketch the graph and show all local extrema and inflection points.

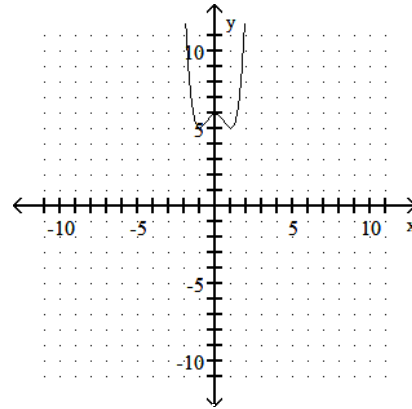
3) $y = -x^4 + 2x^2 - 6$

3) _____

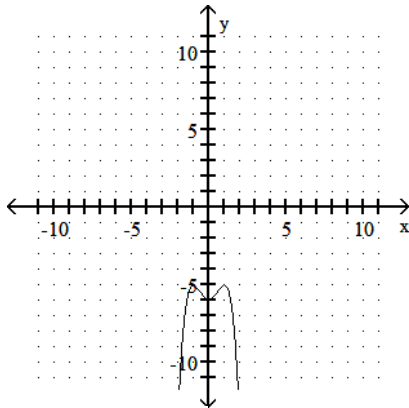
- A) Absolute maxima: $(-1, -5), (1, -5)$
 Local minimum: $(0, -6)$
 No inflection points



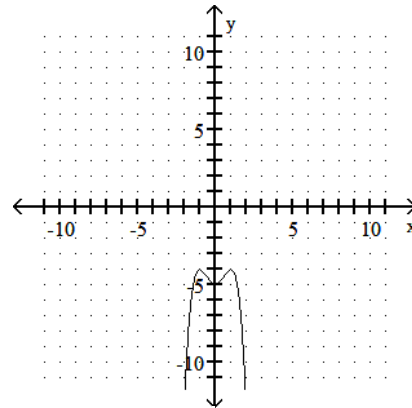
- B) Absolute minima: $(-1, 5), (1, 5)$
 Local maximum: $(0, 6)$
 Inflection point: $\left(-\sqrt{\frac{1}{3}}, \frac{49}{9}\right), \left(\sqrt{\frac{1}{3}}, \frac{49}{9}\right)$



- C) Absolute maxima: $(-1, -5), (1, -5)$
 Local minimum: $(0, -6)$
 Inflection points: $\left(-\sqrt{\frac{1}{3}}, -\frac{49}{9}\right), \left(\sqrt{\frac{1}{3}}, -\frac{49}{9}\right)$



- D) Absolute maxima: $(-1, -5), (1, -5)$
 Inflection points: $\left(-\sqrt{\frac{1}{3}}, \frac{5}{9}\right), \left(\sqrt{\frac{1}{3}}, \frac{5}{9}\right)$

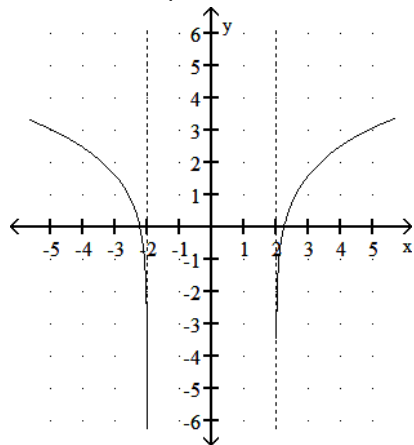


4) $y = \ln(4 - x^2)$

4) _____

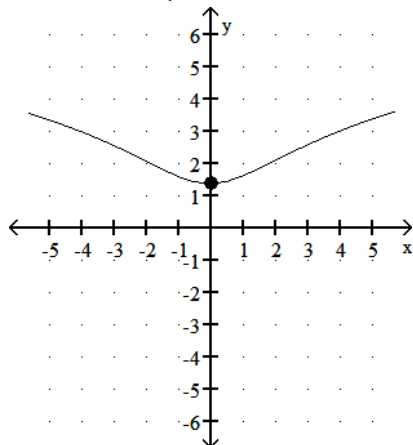
A) No extrema

No inflection point



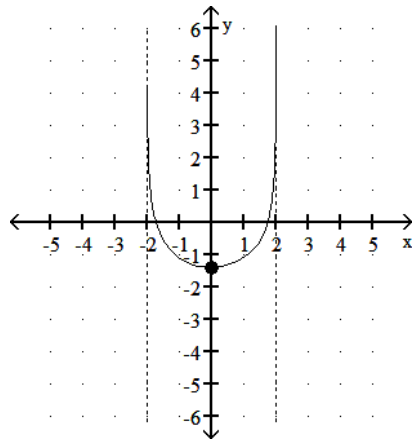
B) Local minimum (0, ln 4)

No inflection point



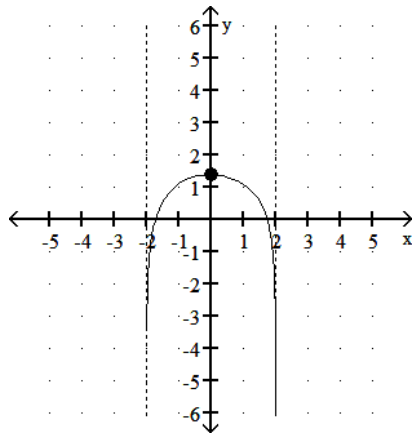
C) Local minimum (0, -ln 4)

No inflection point



D) Local maximum (0, ln 4)

No inflection point

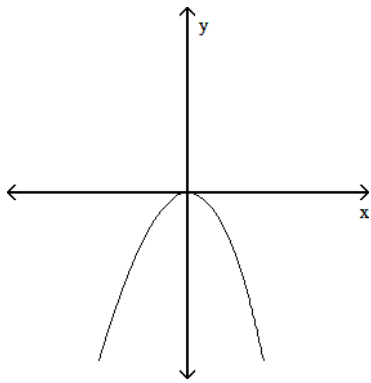


For the given expression y' , find y'' and sketch the general shape of the graph of $y = f(x)$.

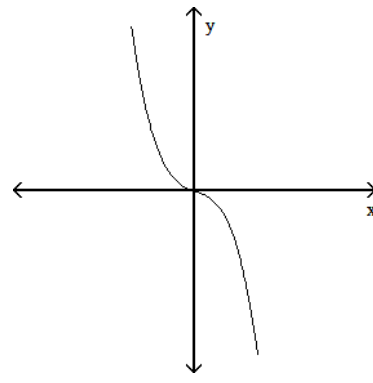
5) $y' = \frac{x^2}{5} - 4$

5) _____

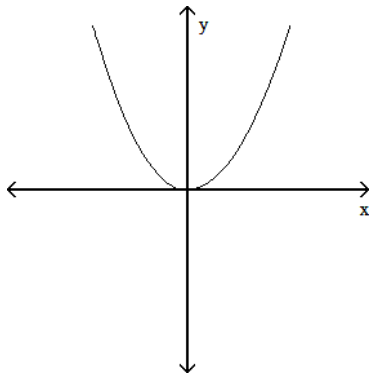
A)



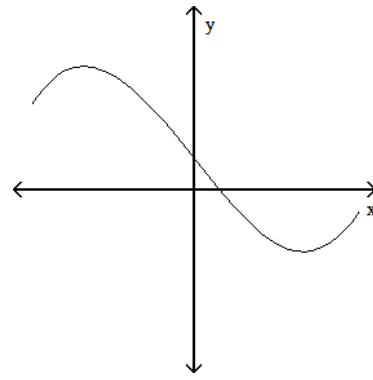
B)



C)



D)



Answer Key

Testname: PRACTICE17

- 1) D
- 2) A
- 3) C
- 4) D
- 5) D