H8

A

[Ex 4.3]

a. Find the intervals on which the function is increasing and decreasing.

b. Then identify the function's local extreme values, if any, saying where they are taken on.

c. Which, if any, of the extreme values are absolute?

11. $h(x) = -x^3 + 2x^2$

17. $f(x) = x^4 - 8x^2 + 16$

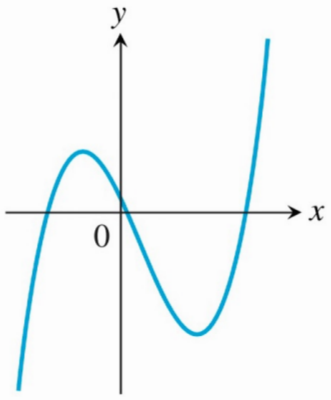
21. $g(x) = x\sqrt{8 - x^2}$

B

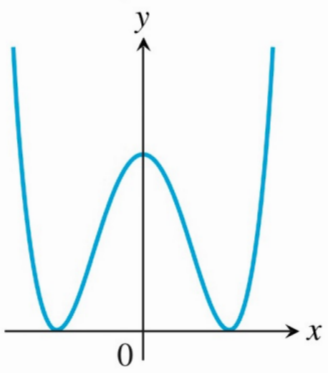
[Ex 4.4]

Identify the inflection points and local maxima and minima of the functions graphed in Exercises. Identify the intervals on which the functions are concave up and concave down.

1. $y = \frac{x^3}{3} - \frac{x^2}{2} - 2x + \frac{1}{3}$



2. $y = \frac{x^4}{4} - 2x^2 + 4$



C

Sketch the following functions after finding

a. coordinates of local extrema

b. regions where increasing/decreasing

c. regions where concave up/down

d. coordinates of inflection points

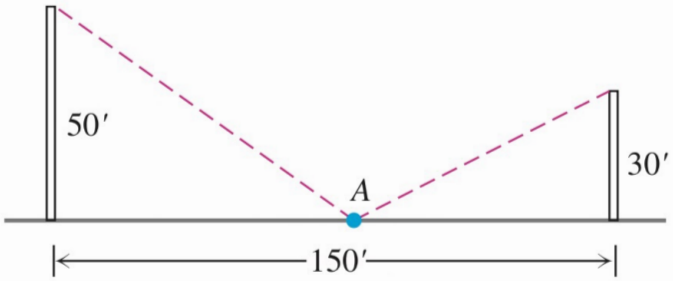
9. $y = x^2 - 4x + 3$

17. $y = x^4 - 2x^2 = x^2(x^2 - 2)$

D

[Ex 4.1]

58. Length of a guy wire One tower is 50 ft high and another tower is 30 ft high. The towers are 150 ft apart. A guy wire is to run from Point A to the top of each tower.



a. Locate Point A so that the total length of guy wire is minimal.

b. Show in general that regardless of the height of the towers, the length of guy wire is minimized if the angles at A are equal.

E

63. Maximum height of a vertically moving body The height of a body moving vertically is given by

$$s = -\frac{1}{2}gt^2 + v_0 t + s_0, \qquad g > 0,$$

with s in meters and t in seconds. Find the body's maximum height.

F

[Ex 4.5]

7. The best fencing plan A rectangular plot of farmland will be bounded on one side by a river and on the other three sides by a single-strand electric fence. With 800m of wire at your disposal, what is the largest area you can enclose, and what are its dimensions?