Derivative Application Practice Test

1. Find the equation of the tangent line to $y = x^3 + \sqrt{x}$ at x=4

2.

THE SNOWBALL PROBLEM

A snowball melts so that its surface area is increasing at a rate of 6 cm^2/min. When the diameter is 7, find the following:

(A) The rate of change, in cm/min, of the diameter.

(B) The rate of change, in cm/min, of the radius.

(C) The rate of change, in cm/min, of the circumference.

3.

The combined perimeter of an equilateral triangle and a square is 10. Find the dimensions of the triangle and square that produce a minimum total area.

4.

6. (AB3 1981)

Let *f* be the function defined by $f(x) = 12x^{2/3} - 4x$

a) Find the intervals on which *f* is increasing.
b) Find the *x*- and *y*-coordinates of all relative maximum points. Justify.
c) Find the *x*- and *y*-coordinates of all relative minimum points. Justify.
d) Find the intervals on which *f* is concave downward.
e) Using the information found in parts a), b), c), and d), sketch the graph of *f*.

Derivative Application Practice Test

1. Find the equation of the tangent line to $y = x^3 + \sqrt{x}$ at x=4

2.

THE SNOWBALL PROBLEM

A snowball melts so that its surface area is increasing at a rate of 6 cm^2/min. When the diameter is 7, find the following:

(A) The rate of change, in cm/min, of the diameter.

(B) The rate of change, in cm/min, of the radius.

(C) The rate of change, in cm/min, of the circumference.

3.

The combined perimeter of an equilateral triangle and a square is 10. Find the dimensions of the triangle and square that produce a minimum total area.

4.

6. (AB3 1981)

Let *f* be the function defined by $f(x) = 12x^{2/3} - 4x$

a) Find the intervals on which *f* is increasing.
b) Find the *x*- and *y*-coordinates of all relative maximum points. Justify.
c) Find the *x*- and *y*-coordinates of all relative minimum points. Justify.
d) Find the intervals on which *f* is concave downward.
e) Using the information found in parts a), b), c), and d), sketch the graph of *f*.

Derivative Application Practice Test

1. Find the equation of the tangent line to $y = x^3 + \sqrt{x}$ at x=4

2.

THE SNOWBALL PROBLEM

A snowball melts so that its surface area is increasing at a rate of 6 cm^2/min. When the diameter is 7, find the following:

(A) The rate of change, in cm/min, of the diameter.

(B) The rate of change, in cm/min, of the radius.

(C) The rate of change, in cm/min, of the circumference.

3.

The combined perimeter of an equilateral triangle and a square is 10. Find the dimensions of the triangle and square that produce a minimum total area.

4.

6. (AB3 1981)

Let *f* be the function defined by $f(x) = 12x^{2/3} - 4x$

a) Find the intervals on which *f* is increasing.
b) Find the *x*- and *y*-coordinates of all relative maximum points. Justify.
c) Find the *x*- and *y*-coordinates of all relative minimum points. Justify.
d) Find the intervals on which *f* is concave downward.
e) Using the information found in parts a), b), c), and d), sketch the graph of *f*.

Derivative Application Practice Test

1. Find the equation of the tangent line to $y = x^3 + \sqrt{x}$ at x=4

2.

THE SNOWBALL PROBLEM

A snowball melts so that its surface area is increasing at a rate of 6 cm^2/min. When the diameter is 7, find the following:

(A) The rate of change, in cm/min, of the diameter.

(B) The rate of change, in cm/min, of the radius.

(C) The rate of change, in cm/min, of the circumference.

3.

The combined perimeter of an equilateral triangle and a square is 10. Find the dimensions of the triangle and square that produce a minimum total area.

4.

6. (AB3 1981)

Let *f* be the function defined by $f(x) = 12x^{2/3} - 4x$

a) Find the intervals on which *f* is increasing.
b) Find the *x*- and *y*-coordinates of all relative maximum points. Justify.
c) Find the *x*- and *y*-coordinates of all relative minimum points. Justify.
d) Find the intervals on which *f* is concave downward.
e) Using the information found in parts a), b), c), and d), sketch the graph of *f*.