Optimization with Derivatives · 1

A farmer has 60 ft of fencing to make a rectangular pen along a straight river; no fence is needed along the river. What is the largest area the pen can have (in ft²)?

Optimization with Derivatives · 2

A rectangle must have an area of 441 ft². What is the smallest perimeter it can have (in ft)?

Optimization with Derivatives · 3

An open box is made from a 24 in by 24 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What is the largest possible volume (in in³)?

Optimization with Derivatives · 4

Two positive numbers add up to 52. What is the largest possible value of their product?

Optimization with Derivatives · 5

A company's profit from selling x items is $P(x) = -2x^2 + 80x - 350$ dollars. What is the largest possible profit?

Optimization with Derivatives · 6

Two positive numbers multiply to 256. What is the smallest possible value of their sum?

Optimization with Derivatives · 7

A farmer has 104 ft of fencing to make a rectangular pen along a straight river; no fence is needed along the river. What is the largest area the pen can have (in ft²)?

Optimization with Derivatives · 8

A farmer has 160 ft of fencing to make a rectangular pen along a straight river; no fence is needed along the river. What is the largest area the pen can have (in ft²)?

Optimization with Derivatives · 2

ANSWER

84

Optimization with Derivatives · 1

ANSWER

450

Optimization with Derivatives · 4

ANSWER

676

Optimization with Derivatives · 3

ANSWER

1024

Optimization with Derivatives · 6

ANSWER

32

Optimization with Derivatives · 5

ANSWER

450

Optimization with Derivatives · 8

ANSWER

3200

Optimization with Derivatives · 7

ANSWER

1352

Optimization with Derivatives · 9

An open box is made from a 30 in by 30 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What is the largest possible volume (in in^3)?

Optimization with Derivatives · 10

An open-top box with a square base must hold 1372 cm^3. What is the least amount of material (surface area in cm^2) it can use?

Optimization with Derivatives · 11

A rectangular garden of 150 ft^2 is fenced on all four sides. The fence along the front costs $8 per foot and the other three sides cost $4 per foot. What is the least possible cost of the fence (in dollars)?

Optimization with Derivatives · 12

Two positive numbers x and y add up to 6. What is the largest possible value of $x \cdot y^2$?

Optimization with Derivatives · 13

A farmer has 152 ft of fencing to make a rectangular pen along a straight river; no fence is needed along the river. What is the largest area the pen can have (in ft^2)?

Optimization with Derivatives · 14

An open box is made from a 5 in by 8 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What is the largest possible volume (in in^3)?

Optimization with Derivatives · 15

An open box is made from a 24 in by 24 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What side length of square should be cut to make the volume as large as possible?

Optimization with Derivatives · 16

An open box is made from a 9 in by 24 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What side length of square should be cut to make the volume as large as possible?

Optimization with Derivatives · 10

ANSWER

588

Optimization with Derivatives · 9

ANSWER

2000

Optimization with Derivatives · 12

ANSWER

32

Optimization with Derivatives · 11

ANSWER

240

Optimization with Derivatives · 14

ANSWER

18

Optimization with Derivatives · 13

ANSWER

2888

Optimization with Derivatives · 16

ANSWER

2

Optimization with Derivatives · 15

ANSWER

4

Optimization with Derivatives · 17

An open-top box with a square base must hold 108 cm^3. What is the least amount of material (surface area in cm^2) it can use?

Optimization with Derivatives · 18

A rectangular garden of 432 ft^2 is fenced on all four sides. The fence along the front costs $3 per foot and the other three sides cost $6 per foot. What is the least possible cost of the fence (in dollars)?

Optimization with Derivatives · 19

Two positive numbers x and y add up to 18. What is the largest possible value of $x \cdot y^2$?

Optimization with Derivatives · 20

A farmer has 56 ft of fencing to make a rectangular pen along a straight river; no fence is needed along the river. What is the largest area the pen can have (in ft^2)?

Optimization with Derivatives · 21

An open box is made from a 5 in by 8 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What side length of square should be cut to make the volume as large as possible?

Optimization with Derivatives · 22

An open box is made from an 18 in by 18 in sheet of cardboard by cutting equal squares from the corners and folding up the sides. What side length of square should be cut to make the volume as large as possible?

Optimization with Derivatives · 23

A rectangular garden of 720 ft^2 is fenced on all four sides. The fence along the front costs $3 per foot and the other three sides cost $2 per foot. What is the least possible cost of the fence (in dollars)?

Optimization with Derivatives · 24

A farmer has 100 ft of fencing to make a rectangular pen along a straight river; no fence is needed along the river. What is the largest area the pen can have (in ft^2)?

Optimization with Derivatives · 18

ANSWER

432

Optimization with Derivatives · 17

ANSWER

108

Optimization with Derivatives · 20

ANSWER

392

Optimization with Derivatives · 19

ANSWER

864

Optimization with Derivatives · 22

ANSWER

3

Optimization with Derivatives · 21

ANSWER

1

Optimization with Derivatives · 24

ANSWER

1250

Optimization with Derivatives · 23

ANSWER

240