Task card 1 Optimization with Derivatives

An open box is made from a 15 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?

Task card 2 Optimization with Derivatives

A rectangular garden of 648 ft² is fenced on all four sides. The fence along the front costs $5 per foot and the other three sides cost $4 per foot. What is the least possible cost of the fence (in dollars)?

Task card 3 Optimization with Derivatives

An open-top box with a square base must hold 1372 cm³. What base side length uses the least material?

Task card 4 Optimization with Derivatives

Two positive numbers x and y add up to 24. What is the largest possible value of $x \cdot y^2$?

Task card 5 Optimization with Derivatives

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?

Task card 6 Optimization with Derivatives

A rectangular garden of 180 ft² is fenced on all four sides. The fence along the front costs $9 per foot and the other three sides cost $6 per foot. What is the least possible cost of the fence (in dollars)?

Task card 7 Optimization with Derivatives

A rectangular garden of 648 ft² is fenced on all four sides. The fence along the front costs $12 per foot and the other three sides cost $4 per foot. What is the least possible cost of the fence (in dollars)?

Task card 8 Optimization with Derivatives

An open-top box with a square base must hold 256 cm³. What base side length uses the least material?

Task card 9 Optimization with Derivatives

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 in³)?

Task card 10 Optimization with Derivatives

A rectangular garden of 864 ft² is fenced on all four sides. The fence along the front costs $12 per foot and the other three sides cost $6 per foot. What is the least possible cost of the fence (in dollars)?

Task card 11 Optimization with Derivatives

An open-top box with a square base must hold 32 cm³. What is the least amount of material (surface area in cm²) it can use?

Task card 12 Optimization with Derivatives

Two positive numbers x and y add up to 21. What is the largest possible value of $x \cdot y^2$?

Task card 13 Optimization with Derivatives

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 is the largest possible volume (in in^3)?

Task card 14 Optimization with Derivatives

A rectangular garden of 1440 ft^2 is fenced on all four sides. The fence along the front costs $12 per foot and the other three sides cost $3 per foot. What is the least possible cost of the fence (in dollars)?

Task card 15 Optimization with Derivatives

A rectangular garden of 336 ft^2 is fenced on all four sides. The fence along the front costs $11 per foot and the other three sides cost $3 per foot. What is the least possible cost of the fence (in dollars)?

Task card 16 Optimization with Derivatives

Two positive numbers x and y add up to 9. What is the largest possible value of $x \cdot y^2$?

Task card 17 Optimization with Derivatives

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 is the largest possible volume (in in^3)?

Task card 18 Optimization with Derivatives

A rectangular garden of 648 ft^2 is fenced on all four sides. The fence along the front costs $9 per foot and the other three sides cost $3 per foot. What is the least possible cost of the fence (in dollars)?

Task card 19 Optimization with Derivatives

Two positive numbers x and y add up to 15. What is the largest possible value of $x \cdot y^2$?

Task card 20 Optimization with Derivatives

An open box is made from a 36 in by 36 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)?

Task card 21 Optimization with Derivatives

A rectangular garden of 384 ft^2 is fenced on all four sides. The fence along the front costs $12 per foot and the other three sides cost $6 per foot. What is the least possible cost of the fence (in dollars)?

Task card 22 Optimization with Derivatives

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 in^3)?

Task card 23 Optimization with Derivatives

A rectangular garden of 680 ft^2 is fenced on all four sides. The fence along the front costs $12 per foot and the other three sides cost $5 per foot. What is the least possible cost of the fence (in dollars)?

Task card 24 Optimization with Derivatives

A rectangular garden of 270 ft^2 is fenced on all four sides. The fence along the front costs $4 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 Task Cards

Recording sheet · Grade 12 · Give just the number asked for, with no units or $ sign. Every answer is a whole number.

Name: _____ Date: _____

Scan to check your answers

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24

Optimization with Derivatives Task Cards: Answer Key

Grade 12 · Hard

The answers online

1. 3	**2.** 432	**3.** 14
4. 2048	**5.** 3	**6.** 360
7. 576	**8.** 8	**9.** 18
10. 864	**11.** 48	**12.** 1372
13. 432	**14.** 720	**15.** 336
16. 108	**17.** 200	**18.** 432
19. 500	**20.** 3456	**21.** 576
22. 1024	**23.** 680	**24.** 360