Task card 1 Optimization with Derivatives

A ball is thrown upward. Its height after t seconds is $h(t) = -5t^2 + 30t + 9$ meters. What is its maximum height?

Task card 2 Optimization with Derivatives

Two positive numbers add up to 38. What is the largest possible value of their product?

Task card 3 Optimization with Derivatives

You have 24 m of fencing to enclose a rectangle. What is the largest area you can enclose (in m^2)?

Task card 4 Optimization with Derivatives

A company's profit from selling x items is $P(x) = -5x^2 + 100x - 250$ dollars. How many items should it sell to make the most profit?

Task card 5 Optimization with Derivatives

A ball is thrown upward. Its height after t seconds is $h(t) = -16t^2 + 128t + 9$ feet. What is its maximum height?

Task card 6 Optimization with Derivatives

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

Task card 7 Optimization with Derivatives

A ball is thrown upward. Its height after t seconds is $h(t) = -5t^2 + 40t + 10$ meters. What is its maximum height?

Task card 8 Optimization with Derivatives

You have 84 m of fencing to enclose a rectangle. What is the largest area you can enclose (in m^2)?

Task card 9 Optimization with Derivatives

A ball is thrown upward. Its height after t seconds is $h(t) = -5t^2 + 40t + 3$ meters. What is its maximum height?

Task card 10 Optimization with Derivatives

You have 60 m of fencing to enclose a rectangle. What is the largest area you can enclose (in m^2)?

Task card 11 Optimization with Derivatives

A farmer has 136 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)?

Task card 12 Optimization with Derivatives

A company's profit from selling x items is $P(x) = -2x^2 + 60x - 100$ dollars. What is the largest possible profit?

Task card 13 Optimization with Derivatives

Two positive numbers multiply to 64. What is the smallest possible value of their sum?

Task card 14 Optimization with Derivatives

A farmer has 112 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)?

Task card 15 Optimization with Derivatives

You have 16 m of fencing to enclose a rectangle. What is the largest area you can enclose (in m^2)?

Task card 16 Optimization with Derivatives

A company's profit from selling x items is $P(x) = -5x^2 + 200x - 400$ dollars. How many items should it sell to make the most profit?

Task card 17 Optimization with Derivatives

A farmer has 128 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)?

Task card 18 Optimization with Derivatives

A rectangle must have an area of 400 ft^2. What is the smallest perimeter it can have (in ft)?

Task card 19 Optimization with Derivatives

An open box is made from a 6 in by 6 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 20 Optimization with Derivatives

Two positive numbers add up to 16. What is the largest possible value of their product?

Task card 21 Optimization with Derivatives

A company's profit from selling x items is $P(x) = -x^2 + 40x - 350$ dollars. How many items should it sell to make the most profit?

Task card 22 Optimization with Derivatives

Two positive numbers multiply to 361. What is the smallest possible value of their sum?

Task card 23 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 24 Optimization with Derivatives

A rectangle must have an area of 25 ft^2. What is the smallest perimeter it can have (in ft)?

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 · Easy

The answers online

1. 54	**2.** 361	**3.** 36
4. 10	**5.** 265	**6.** 676
7. 90	**8.** 441	**9.** 83
10. 225	**11.** 2312	**12.** 350
13. 16	**14.** 1568	**15.** 16
16. 20	**17.** 2048	**18.** 80
19. 1	**20.** 64	**21.** 20
22. 38	**23.** 1024	**24.** 20