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1. (1 pt) Find two numbers A and B (with $A \leq B$) whose difference is 38 and whose product is minimized.

$A =$ _____

$B =$ _____

Answer(s) submitted:

- -19
- 19

(correct)

Correct Answers:

- -19
- 19

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2. (1 pt) Find two positive numbers whose product is 196 and whose sum is a minimum.

Answer: _____, _____

Answer(s) submitted:

- 14
- 14

(correct)

Correct Answers:

- 14
- 14

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3. (1 pt) Find the length L and width W (with $W \leq L$) of the rectangle with perimeter 80 that has maximum area, and then find the maximum area.

$L =$ _____

$W =$ _____

Maximum area = _____

Answer(s) submitted:

- 20
- 20
- 400

(correct)

Correct Answers:

- 20
- 20
- 400

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4. (1 pt) A fence is to be built to enclose a rectangular area of 290 square feet. The fence along three sides is to be made of material that costs 5 dollars per foot, and the material for the fourth side costs 14 dollars per foot. Find the length L and width W (with $W \leq L$) of the enclosure that is most economical to construct.

$L =$ _____

$W =$ _____

Answer(s) submitted:

- 23.47
- 12.35

(correct)

Correct Answers:

- 23.473389188611
- 12.3544153624268

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5. (1 pt) A box is to be made out of a 10 cm by 16 cm piece of cardboard. Squares of side length x cm will be cut out of each corner, and then the ends and sides will be folded up to form a box with an open top.

(a) Express the volume V of the box as a function of x.

$V =$ _____ cm^3

(b) Give the domain of V in interval notation. (Use the fact that length and volume must be positive.)

_____

(c) Find the length L, width W, and height H of the resulting box that maximizes the volume. (Assume that $W \leq L$).

$L =$ _____ cm

$W =$ _____ cm

$H =$ _____ cm

(d) The maximum volume of the box is _____ cm^3.

Answer(s) submitted:

- (4x^3) - (52x^2) + (160x)
- (0, 5)
- 12
- 6
- 2
- 144

(correct)

Correct Answers:

- `(10 - 2 * x)(16 - 2 *x)x`
- `(0,5)`
- `12`
- `6`
- `2`
- `144`

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6. (1 pt) A rectangular storage container with an open top is to have a volume of 12 cubic meters. The length of its base is twice the width. Material for the base costs 13 dollars per square meter. Material for the sides costs 7 dollars per square meter. Find the cost of materials for the cheapest such container.

Total cost = _____ (Round to the nearest penny and include monetary units. For example, if your answer is 1.095, enter $1.10 including the dollar sign and second decimal place.)

Answer(s) submitted:

- `$223.37`

(correct)

Correct Answers:

- `\$223.37`

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7. (1 pt) Find the minimum distance from the parabola

$$x+y^2=0$$

to the point (0,-3).

Minimum distance = _____

Answer(s) submitted:

- `sqrt(5)`

(correct)

Correct Answers:

- `2.23606797749979`

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8. (1 pt) A rectangle is inscribed with its base on the x-axis and its upper corners on the parabola $y = 11 - x^2$. What are the dimensions of such a rectangle with the greatest possible area?

Width = _____ Height = _____

Answer(s) submitted:

- `2sqrt(11/3)`
- `11-(11/3)`

(correct)

Correct Answers:

- `3.82970843102535`
- `7.33333333333333`