

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) The cost C , in dollars, to produce graphing calculators is given by the function $C(x) = 56x + 4000$, where x is the number of calculators produced. What is the cost to produce 1600 calculators? 1) _____
A) \$89,600 B) \$93,950 C) \$93,600 D) \$85,600
- 2) A factory invests \$80,000 in new technological equipment that depreciates at a rate of \$16,000 per year. 2) _____
i) Determine an equation for the depreciation function.
ii) How much will the equipment be worth in 2 years?
iii) In how many years will the equipment have no worth? Round to two decimal places, if necessary.
A) i) $f(x) = -16,000x + 80,000$
 ii) In 2 years, the equipment will be worth \$48,000.
 iii) The equipment will have no worth in 5 years.
B) i) $f(x) = 80,000x - 16,000$
 ii) In 2 years, the equipment will be worth \$32,000.
 iii) The equipment will have no worth in 5 years.
C) i) $f(x) = -16,000x + 80,000$
 ii) In 2 years, the equipment will be worth \$49,000.
 iii) The equipment will have no worth in 5 years.
D) i) $f(x) = -16,000x + 80,000$
 ii) In 2 years, the equipment will be worth \$32,000.
 iii) The equipment will have no worth in 6 years.
- 3) The cost of manufacturing a molded part is related to the quantity produced during a production run. When 100 parts are produced, the cost is \$300. When 400 parts are produced, the cost is \$2700. What is the average cost per part? 3) _____
A) \$8.00 per part B) \$6.00 per part C) \$9.00 per part D) \$0.12 per part
- 4) A shoe company will make a new type of shoe. The fixed cost for the production will be \$24,000. The variable cost will be \$33 per pair of shoes. The shoes will sell for \$101 for each pair. How many pairs of shoes will have to be sold for the company to break even on this new line of shoes? 4) _____
A) 353 pairs B) 238 pairs C) 728 pairs D) 68 pairs

Solve the problem.

- 5) Marty's Tee Shirt & Jacket Company is to produce a new line of jackets with an embroidery of a Great Pyrenees dog on the front. There are fixed costs of \$520 to set up for production, and variable costs of \$38 per jacket. Write an equation that can be used to determine the total cost, $C(x)$, encountered by Marty's Company in producing x jackets. 5) _____
A) $C(x) = (520 + 38)x$ B) $C(x) = 520 + 38x$
C) $C(x) = 520 - 38x$ D) $C(x) = 520x + 38$
- 6) A manufacturer determined that its marginal cost per unit produced is given by the function 6) _____
 $C'(x) = 0.0006x^2 - 0.4x + 80$.
Find the total cost of producing the 301st unit through the 400th unit.
A) \$1400 B) \$1386.02 C) \$5100 D) \$8800

- 7) An object moves in such a way that its velocity (in m/s) after time t (in sec.) is given by 7) _____
 $v = t^2 + 6t + 7$.
 Find the distance traveled by the object during the first four seconds.
 A) 47.0 m B) 76.0 m C) 97.3 m D) 69.3 m

Solve the problem.

- 8) Suppose that in a memory experiment the rate of memorizing is given by 8) _____
 $M'(t) = -0.006t^2 + 0.4t$,
 where $M'(t)$ is the memory rate, in words per minute. How many words are memorized in the first 30 minutes (from $t = 0$ to $t = 30$)?
 A) 36 B) 216 C) 126 D) 306

- 9) Suppose the the profit realized by a department store t days after its opening is given by the 9) _____
 formula $4t^3 - 2t + 1$. What was the average profit per day of the store during the first five days?
 A) \$121
 B) \$218
 C) \$225
 D) \$97.80
 E) none of these

Solve the problem.

- 10) The concentration of a certain drug in the bloodstream t minutes after swallowing a pill containing 10) _____
 the drug can be approximated using the equation $C(t) = \frac{1}{2}(2t + 1)^{-1/2}$, where $C(t)$ is the
 concentration in arbitrary units and t is in minutes. Find the rate of change of concentration with
 respect to time at $t = 24$ minutes.
 A) $-\frac{1}{14}$ units/min B) $-\frac{1}{686}$ units/min
 C) $-\frac{1}{14}$ units/min D) $-\frac{1}{1372}$ units/min

Differentiate.

- 11) $f(x) = (2x^3 + 9)(4x^7 - 7)$ 11) _____
 A) $f'(x) = 80x^9 + 252x^6 - 42x^2$ B) $f'(x) = 8x^9 + 252x^6 - 42x^2$
 C) $f'(x) = 8x^9 + 252x^6 - 42x$ D) $f'(x) = 80x^9 + 252x^6 - 42x$

Answer Key

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- 1) C
- 2) A
- 3) A
- 4) A
- 5) B
- 6) B
- 7) C
- 8) C
- 9) A
- 10) B
- 11) A