

**Stewart\_Essential Calc\_2e ch02sec01**

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**MULTIPLE CHOICE**

1. Find an equation of the tangent line to the parabola  $y = 5x^3$  at the point  $(-5, -145)$ .

- a.  $y = 395x - 1730$
- b.  $y = 375x + 1730$
- c.  $y = 395x + 1730$
- d.  $y = 395x - 1730$
- e.  $y = 375x - 1730$

ANS: B                      PTS: 1                      DIF: Medium                      REF: 2.1.3  
MSC: Bimodal                      NOT: Section 2.1

2. Find an equation of the tangent line to the curve  $y = x^3 - 2x$  at the point  $(2, 6)$ .

- a.  $y = x - 6$
- b.  $y = 2 + 2x$
- c.  $y = 2 - 2x$
- d.  $y = 6 + 2x$
- e. None of these

ANS: E                      PTS: 1                      DIF: Medium                      REF: 2.1.4  
MSC: Bimodal                      NOT: Section 2.1

3. Find the slope of the tangent line to the curve  $y = 5x^2$  at the point  $(-4, 22)$ .

- a. 40
- b. -40
- c. 25
- d. 4
- e. -4

ANS: B                      PTS: 1                      DIF: Medium                      REF: 2.1.5  
MSC: Bimodal                      NOT: Section 2.1

4. If an equation of the tangent line to the curve  $y = f(x)$  at the point where  $a = 3$  is  $y = 4x - 9$ , find  $f(3)$  and  $f'(3)$ .

- a.  $f(2) = 9$   
 $f'(2) = 4$
- b.  $f(2) = -3$   
 $f'(2) = 3$

c.  $f(2) = 3$

$f'(2) = 3$

d.  $f(2) = 3$

$f'(2) = 4$

e. None of these

ANS: D

PTS: 1

DIF: Medium

REF: 2.1.17

MSC: Bimodal

NOT: Section 2.1

5. Use the definition of the derivative to find  $f'(3)$ , where  $f(x) = x^3 - 2x$ .

a. 25

b. 27

c. -25

d. 18

e. does not exist

ANS: A

PTS: 1

DIF: Medium

REF: 2.1.25

MSC: Bimodal

NOT: Section 2.1

6. The cost (in dollars) of producing  $x$  units of a certain commodity is

$$C(x) = 4,571 + 17x + 0.02x^2.$$

Find the instantaneous rate of change with respect to  $x$  when  $x = 103$ . (This is called the *marginal cost*.)

a. 21.12

b. 19.06

c. 23.18

d. 19.06

e. 4.12

ANS: A

PTS: 1

DIF: Medium

REF: 2.1.26

MSC: Bimodal

NOT: Section 2.1

## NUMERIC RESPONSE

1. Find the derivative of the function.

$$f(x) = 14 - 4x + 5x^2$$

ANS:  $10x - 4$

PTS: 1

DIF: Medium

REF: 2.1.41a

MSC: Numerical Response

NOT: Section 2.1

2. The cost (in dollars) of producing  $x$  units of a certain commodity is

$$C(x) = 4,336 + 12x + 0.07x^2.$$

Find the average rate of change with respect to  $x$  when the production level is changed from  $x = 105$  to  $x = 107$ .

ANS: 26.84

PTS: 1                      DIF: Medium                      REF: 2.1.41b  
MSC: Numerical Response                      NOT: Section 2.1

3. If a cylindrical tank holds 10000 gallons of water, which can be drained from the bottom of the tank in an hour, then Torricelli's Law gives the volume of water remaining in the tank after  $t$  minutes as

$$V(t) = 10000 \left( 1 - \frac{1}{60}t \right)^2, 0 \leq t \leq 60$$

Find the rate at which the water is flowing out of the tank (the instantaneous rate of change of  $V$  with respect to  $t$ ) as a function of  $t$ .

ANS:  $V'(t) = \frac{-1000}{3} + \frac{50t}{9}$

PTS: 1                      DIF: Medium                      REF: 2.1.42  
MSC: Numerical Response                      NOT: Section 2.1