MULTIPLE CHOICE

1. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.

   Find the distance traveled in 16 seconds by an object traveling at a constant velocity of 20 feet per second.

   a. calculus, 320 ft
   b. calculus, 340 ft
   c. precalculus, 320 ft
   d. calculus, 640 ft
   e. precalculus, 640 ft

   ANS: C PTS: 1 DIF: Easy REF: 1.1.1
   OBJ: Recognize problems requiring precalculus and find the solution
   MSC: Skill NOT: Section 1.1

2. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.

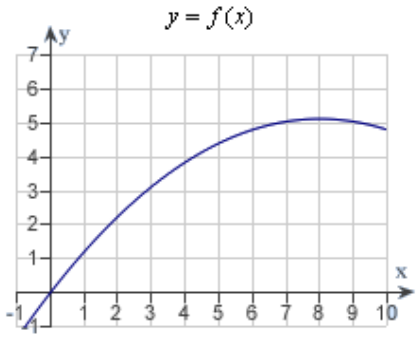
   Find the distance traveled in 20 seconds by an object moving with a velocity of $v(t) = 8 + 6\cos t$ feet per second.

   a. calculus, 162.4485 ft
   b. precalculus, 163.7985 ft
   c. calculus, 165.4777 ft
   d. precalculus, 165.4777 ft
   e. precalculus, 162.4485 ft

   ANS: C PTS: 1 DIF: Medium REF: 1.1.2
   OBJ: Recognize problems requiring calculus and estimate solutions
   MSC: Skill NOT: Section 1.1

3. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.

   A cyclist is riding on a path whose elevation is modeled by the function $f(x) = 0.08\left(16x - x^2\right)$ where x and $f(x)$ are measured in miles. Find the rate of change of elevation when $x = 4$.

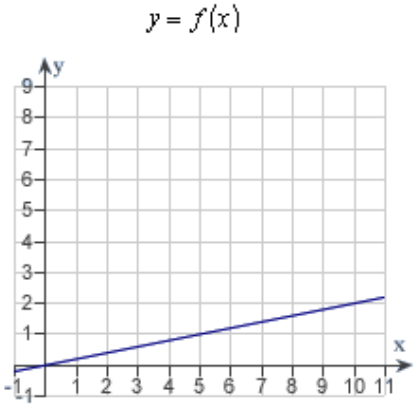


a. precalculus, 0.08
b. calculus, 0.2
c. calculus, 0.64
d. calculus, 0.08
e. precalculus, 0.2

ANS: C PTS: 1 DIF: Medium REF: 1.1.3
OBJ: Recognize problems requiring calculus and estimate solutions
MSC: Skill NOT: Section 1.1

4. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.

   A cyclist is riding on a path whose elevation is modeled by the function $f(x) = 0.2x$ where x and $f(x)$ are measured in miles. Find the rate of change of elevation when $x = 5$.

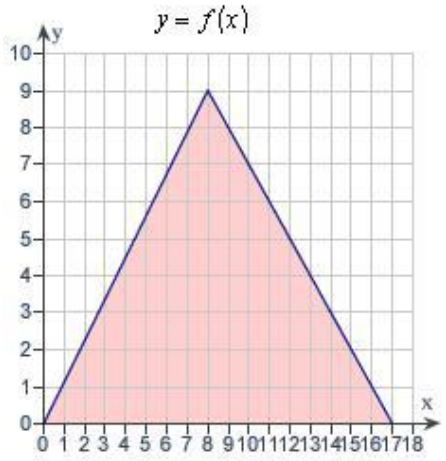


a. calculus, 2
b. precalculus, 0.2
c. calculus, 0.2
d. precalculus, 2
e. precalculus, 0.45

ANS: B PTS: 1 DIF: Easy REF: 1.1.4
OBJ: Recognize problems requiring precalculus and find the solution
MSC: Skill NOT: Section 1.1

5. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.

   Find the area of the shaded region bounded by the triangle with vertices (0,0), (8,9), (17,0).

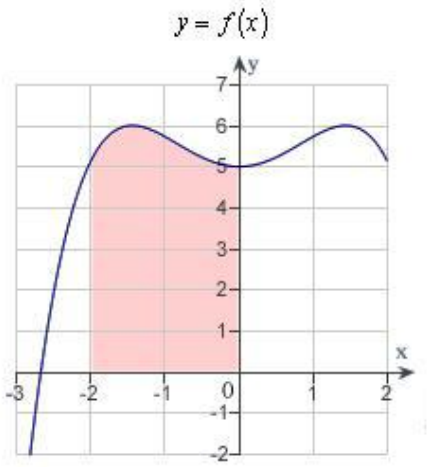


   a. precalculus , 153
   b. calculus , 229.5
   c. precalculus , 76.5
   d. precalculus , 229.5
   e. calculus , 153

   ANS: C PTS: 1 DIF: Easy REF: 1.1.5a
   OBJ: Recognize problems requiring precalculus and find the solution
   MSC: Skill NOT: Section 1.1

6. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.

   Find the area of the shaded region.

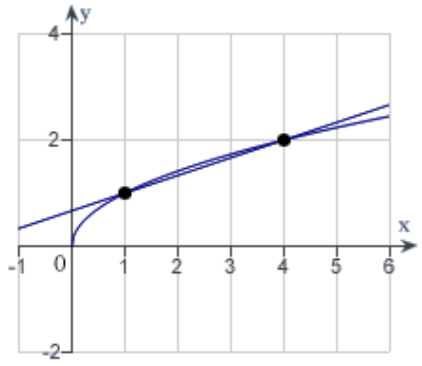


a. calculus , 11
b. precalculus , 11
c. precalculus , 13
d. calculus , 16
e. precalculus , 16

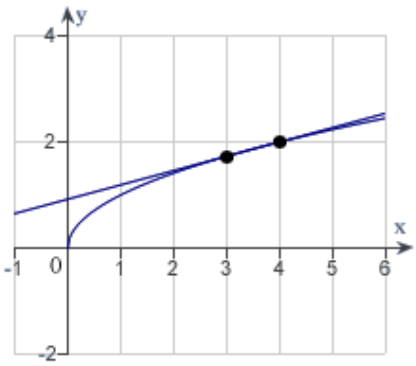
ANS: A PTS: 1 DIF: Medium REF: 1.1.5b
OBJ: Recognize problems requiring calculus and estimate solution
MSC: Skill NOT: Section 1.1

7. Consider the function $f(x) = \sqrt{x}$ and the point $P(4, 2)$ on the graph of *f*. Graph *f* and the secant line passing through $P(4, 2)$ and $Q\left(x, f(x)\right)$ for $x = 3$.

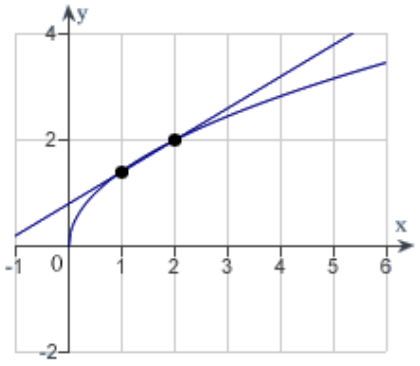
a.



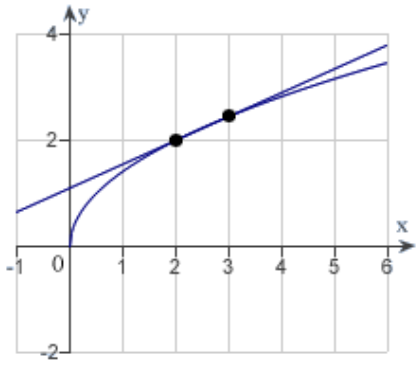
d.



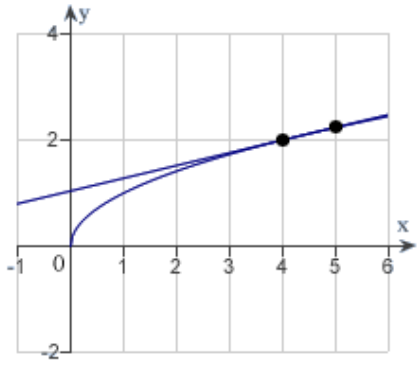
b.



e.



c.



ANS: D PTS: 1 DIF: Easy REF: 1.1.6a
OBJ: Graph a function and the secant line passing through given points
MSC: Skill NOT: Section 1.1

8. Consider the function $f(x) = \sqrt{x}$ and the point $P(81, 9)$ on the graph of *f*. Find the slope of the secant line passing through $P(81, 9)$ and $Q(x, f(x))$ for $x = 1$. Round your answer to four decimal places.

a. m=0.1000
b. m=0.0122
c. m=0.0122
d. m=0.3133
e. m=0.1000

ANS: A PTS: 1 DIF: Easy REF: 1.1.6b
OBJ: Calculate the slope of a secant line passing through given points
MSC: Skill NOT: Section 1.1

9. Consider the function $f(x) = \sqrt{x}$ and the point *P*(64,8) on the graph of *f*.

Consider the secant lines passing through *P*(64,8) and *Q*(*x*, *f*(*x*)) for *x* values of 61, 63, and 65. Find the slope of each secant line to four decimal places.

(Think about how you could use your results to estimate the slope of the tangent line of *f* at *P*(64,8), and how to improve your approximation of the slope.)

a. 0.0633 , –0.0627 , 0.0623
b. 0.0633 , 0.0627 , 0.0623
c. 0.0317 , 0.0314 , 0.0312
d. 0.0633 , –0.0627 , –0.0623
e. –0.0317 , –0.0314 , –0.0312

ANS: D PTS: 1 DIF: Medium REF: 1.1.6b
OBJ: Calculate the slopes of secant lines MSC: Skill NOT: Section 1.1

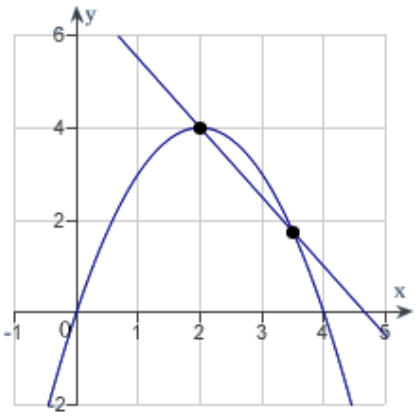
10. Consider the function $f(x) = \sqrt{x}$ and the point $P(9,3)$ on the graph of *f*. Estimate the slope *m* of the tangent line of *f* at $P(9,3)$. Round your answer to four decimal places.

a. m=0.1667
b. m=0.0832
c. m=0.3800
d. m=0.0556
e. m=0.0833

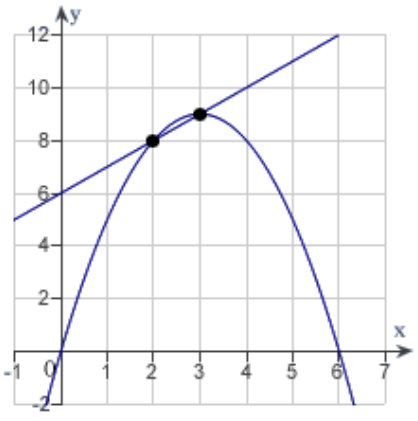
ANS: A PTS: 1 DIF: Medium REF: 1.1.6c
OBJ: Estimate the slope of a tangent line MSC: Skill
NOT: Section 1.1

11. Consider the function $f(x) = 6x - x^2$ and the point $P(2,8)$ on the graph of *f*. Graph *f* and the secant line passing through $P(2,8)$ and $Q(x,f(x))$ for $x = 3$.

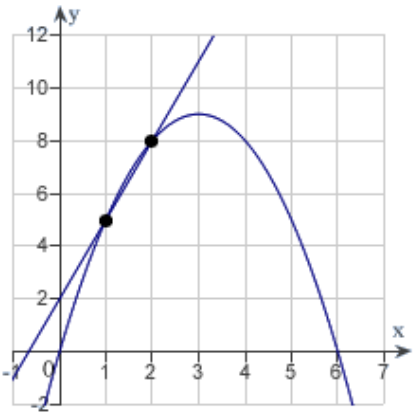
a.



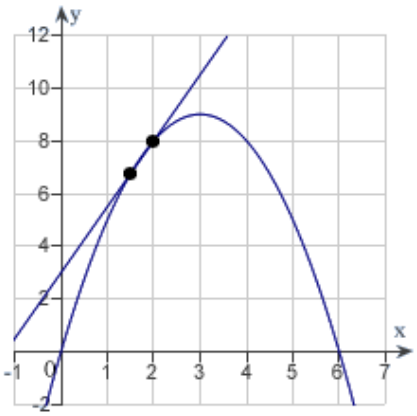
d.



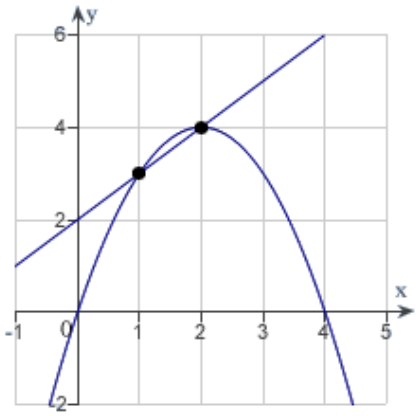
b.



e.



c.



ANS: D PTS: 1 DIF: Easy REF: 1.1.7a
OBJ: Graph a function and the secant line passing through given points
MSC: Skill NOT: Section 1.1

12. Consider the function $f(x) = 11x - x^2$ and the point $P(4, 28)$ on the graph of *f*. Find the slope of the secant line passing through $P(4, 28)$ and $Q(x, f(x))$ for $x = 5$. Round your answer to one decimal place.

a. 3.5
b. 2.0
c. 3.0
d. 4.5
e. 9.0

ANS: B PTS: 1 DIF: Easy REF: 1.1.7b
OBJ: Calculate the slope of a secant line passing through given points
MSC: Skill NOT: Section 1.1

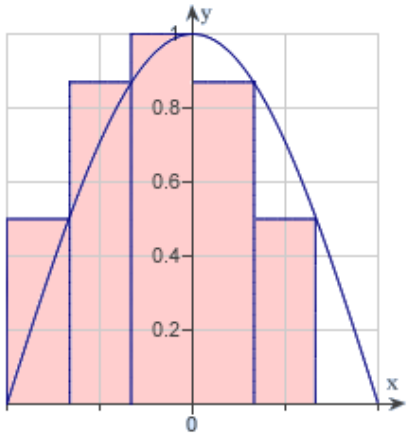
13. Consider the function $f(x) = 8x - x^2$ and the point $P(3, 15)$ on the graph of *f*. Estimate the slope of the tangent line of *f* at $P(3, 15)$.

a. 10
b. 3

c. 8
d. 2
e. 9

ANS: D PTS: 1 DIF: Medium REF: 1.1.7c
OBJ: Calculate the slope of secant line passing through the given points
MSC: Skill NOT: Section 1.1

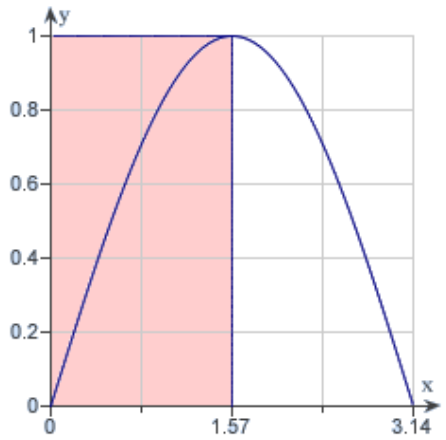
14. Use the rectangles in the following graph to approximate the area of the region bounded by $y = \cos x, y = 0, x = -\frac{\pi}{2}$, and $x = \frac{\pi}{2}$.



a. 3.9082
b. 2.6055
c. 1.9541
d. 1.4656
e. 0.9770

ANS: C PTS: 1 DIF: Medium REF: 1.1.8a
OBJ: Estimate the area of a region using rectangles MSC: Skill
NOT: Section 1.1

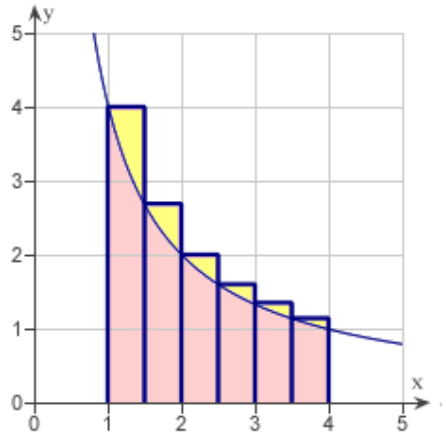
15. Use the rectangles in the following graph to approximate the area of the region bounded by $y = \sin x, y = 0, x = 0$, and $x = \pi$.



a. 0.7850
b. 1.5700
c. 3.1400
d. 1.1775
e. 1.0519

ANS: B PTS: 1 DIF: Medium REF: 1.1.8a
OBJ: Estimate the area of a region using rectangles MSC: Skill
NOT: Section 1.1

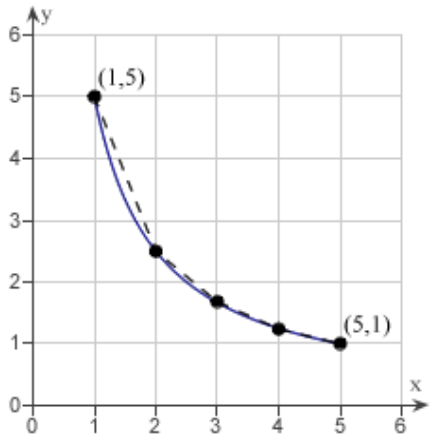
16. Use the rectangles in the graph given below to approximate the area of the region bounded by $y = 4 / x, y = 0, x = 1,$ and $x = 4$ Round your answer to three decimal places.



a. 2.481 units^2
b. 6.371 units^2
c. 3.585 units^2
d. 6.872 units^2
e. 6.903 units^2

ANS: B PTS: 1 DIF: Medium REF: 1.1.9a
OBJ: Estimate the area of a region using rectangles MSC: Skill
NOT: Section 1.1

17. Consider the length of the graph of $f(x) = 5 / x$ from $(1, 5)$ to $(5, 1)$ Approximate the length of the curve by finding the sum of the lengths of four line segments, as shown in following figure. Round your answer to two decimal places.



a. 6.11
b. 8.12
c. 5.66
d. 8.49
e. 7.11

ANS: A PTS: 1 DIF: Medium REF: 1.1.11b
OBJ: Estimate the length of the curve using a piecewise linear function
MSC: Skill NOT: Section 1.1