76.From the graph we know that for -2<x<1 and 1<x<3 f ' has a positive value. For 3<x<5, f ' has a negative value.

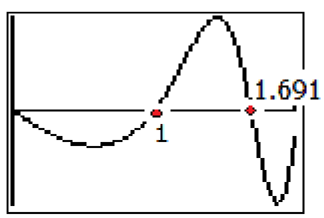
Answer B

Therefore, f is increasing when f ' is positive or -2<x<3.

77. Based on the figure we can see that at x = 2 there is not limit even though the limit from the left $\lim_{x\to 2^-} f$ exist and $\lim_{x\to 2^+} f$ exists since they are not equal to each other.

Answer C

Therefore only I and II are true.

78. Using a graph of f ' 

we can see that f ' is positive between x = 1 and x = 1.691. Therefore f is increasing between these two numbers.

Answer B

79.

$$\int_5^2 f(x)dx = -\int_2^5 f(x)dx$$ and

$$\int_{5}^{2} f(x)dx + \int_{2}^{5} f(x)dx = \int_{-5}^{5} f(x)dx$$ so

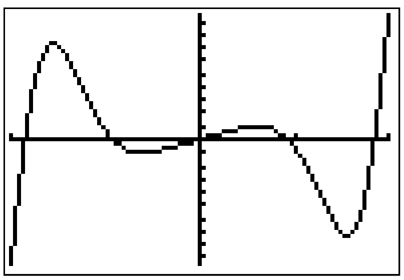
Answer B

$$\int_{-5}^{5} f(x)dx = -17 + -(-4) = -13$$

80.

Graph the derivative of f ' and study how many sign changes take place.

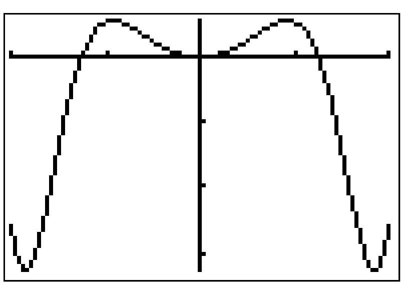
Graph of f "



Answer E

or study a graph of f ' and study how many times the slope change from positive to negative.

Graph of f '



81. If G is the antiderivative of f then

$$G(x) = \int f(x)dx.$$

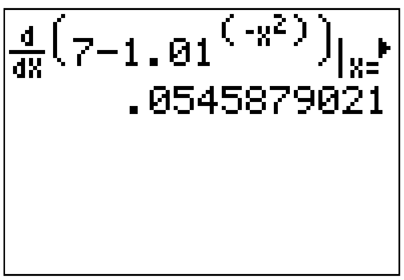
$$G(4) - G(2) = \int_2^4 f(x)dx$$

$$G(4) = G(2) + \int_2^4 f(x)dx$$

$$G(4) = -7 + \int_2^4 f(x)dx$$

Answer E

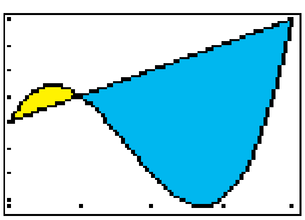
82. Using the graphing calculator it is possible to find an approximation for the numerical derivative of v(t) at 3.



Answer B

83.

If y1 is the curved function and y2 is the straight line the enclosed area is two different areas.



Answer B

The two functions intersect at x = 1, 2, and 5.

We need to find two areas:

Yellow area:

Yellow Area+Blue Area

$$= \int_1^2 (y1 - y2)dx + \int_2^5 (y2 - y1)dx = 11.8333$$

84.

From the graph of f ' we can see that for -3<x<-2 and for 4<x<5 f ' is negative and f is decreasing in these intervals. We can also see that for -2<x<1 and 1<x<4 f ' is positive and f is increasing in these intervals.

Answer C

Therefore, the location of a relative maximum would occur when the function changes from increasing to decreasing This occurs at x = 4 only.

85. If f ' is continuous on the interval [-4,-1] then we know that

Answer B

$$\int_{-4}^{-1} f'(x)dx = f(-1) - f(-4)$$
$$= -1.5 - 0.75$$
$$= -2.25$$

86.

The table show representative values for v(t) at 5 values of t. We know the particle starts at the origin.

At time zero the particle is moving to the left or the graph of x(t) is going down. By time t = 2 the particle has positive velocity so it must be moving to the right or x(t) is moving upward. At time t=3 the particle again has positive velocity so it must be moving to the right of x(t) is moving upward again. At time t = 3 the particle has a velocity of zero so it is momentarily stopped or its distance has reached a extreme. At time t = 4 the particle has negative velocity so it must be moving to the left or x(t) is moving down. Graph C describes this position graph.

Answer C

87. We can find x(3) by using the calculator and the following integral. The numerical approximation for the definite integral can be found on the graphing calculator.

Answer D

$$x(3) = 2 + \int_0^3 v(t)dt = 6.512$$

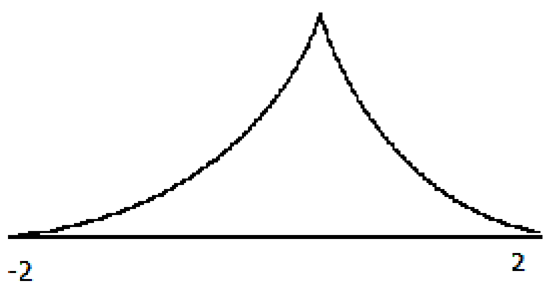
88.

$$\frac{dr}{dt} = -2$$
$$S = 4\pi r^2$$
$$\frac{dS}{dt} = 8\pi r \frac{dr}{dt}$$
$$\frac{dS}{dt} = 8\pi(3)(-2) = -48\pi$$

Answer C

89.

Based on the conditions described the following would describe the graph of f.



Answer E

Therefore f '(k) does not exist for some k.

90.

Noticing the conditions that are stated that f '(3) =2 and f " (x) <0 on the interval (2,4) we need to study the charts given.

In chart A we can calculate the slope between x = 2 and x = 3 to get 2.5 and between x=3 and x=4 to get a 1.5. By the intermediate value theorem it is possible that at x = 3 the slope would be 2.

We can also see that f " would be negative because the slopes are decreasing.

In chart B the slope between x = 2 and x = 3 is 2.5 and between x = 3 and x = 4 the slope is 2, so the intermediate value theorem would not guarantee that the slope could be 2 in between 2 and 4.

In chart C the slope between x = 2 and x = 3 is 2 and between x = 3 and x = 4 the slope is 1.5, so the intermediate value theorem would not guarantee that the slope could be 2 in between 2 and 4.

Answer A

In chart D the slope between x = 2 and x = 3 is 2 and between x = 3 and x = 4 the slope is 2, so the intermediate value theorem would not guarantee that the slope could be 2 in between 2 and 4.

In chart E the slope between x = 2 and x = 3 is 1.5 and between x = 3 and x = 4 the slope is 2.5, so the intermediate value theorem would guarantee that the slope could be 2 in between 2 and 4, but we can see that the f " would be positive because the slopes are increasing.

91.

Answer C

Using the numerical antiderivative on the graphing calculator yields

$$\frac{1}{4}\int_{-1}^{3} y(x)dx = 0.183$$

92.

$$\int_{0}^{4} 7 \bullet density\ dx = \int_{0}^{4} 7f(x)dx$$

Answer B