May 6

Find the tenth derivative of $y = \sin x$

$y^{(10)} = -\sin x$

$$\begin{array}{r} 2\ R\ 2 \\ 4\overline{)10} \\ \underline{8} \\ 2 \end{array}$$

$y' = \cos x$

$y'' = -\sin x$

$y''' = -\cos x$

$y^{(4)} = \sin x$

This weeks test (sets 12 - 18...including related rates)

Must be taken between Friday May 9th and Wednesday May 14th. Class time will be given to take the test on Friday May 9th.

Next week: May 12th - May 16th

Make ups quizzes, multiple choice, and free response assignments will be available.
Plan on coming in to take one if you forgot to make one up or if you want to replace a low score.

May 6

Students will verbally explain how to solve relate rate problems

(using the words: rates, relationships, values, etc...)

Junior class meeting Thursday May 8th at lunch in room 115. We need a little more $$ for a prom deposit. Come to the meeting with a restaurant night set up and earn extra credit!

1. If $y = \dfrac{2-x}{3x+1}$, then $\dfrac{dy}{dx} =$

$$y = \frac{2-x}{3x+1}$$

$$\frac{dy}{dx} = \frac{-1(3x+1)-3(2-x)}{(3x+1)^2} = \frac{-3x-1-6+3x}{(3x+1)^2} = \frac{-7}{(3x+1)^2}$$

$\boxed{\text{(A)}\ -\dfrac{7}{(3x+1)^2}}$ (B) $\dfrac{6x-5}{(3x+1)^2}$ (C) $-\dfrac{9}{(3x+1)^2}$ (D) $\dfrac{7}{(3x+1)^2}$ (E) $\dfrac{7-6x}{(3x+1)^2}$

2. $\lim\limits_{h\to 0}\dfrac{\sqrt[3]{x+h}-\sqrt[3]{x}}{h}=$

$$\lim_{h\to 0}\frac{\sqrt[3]{x+h}-\sqrt[3]{x}}{h}=f'(x)$$

$$f(x)=\sqrt[3]{x}=x^{\frac{1}{3}}$$

$$f'(x)=\frac{1}{3}x^{-\frac{2}{3}}$$

$\boxed{\text{(A) } \frac{1}{3}x^{-\frac{2}{3}}}$ (B) $\frac{1}{3}x^{-\frac{1}{3}}$ (C) $\sqrt[3]{x}$ (D) 0 (E) Nonexistent

If $D(x)=\dfrac{\quad}{g(x)}$, then $D'(1)=$

$$D'(x)=\frac{0\cdot g(x)-g'(x)\cdot 1}{g(x)^2}$$

$$D'(1)=\frac{0\cdot g(1)-g'(1)\cdot 1}{g(1)^2}=\frac{0\cdot(3)-(-3)\cdot 1}{3^2}=\frac{3}{9}=\frac{1}{3}$$

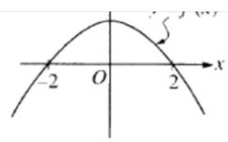
(A) $-\frac{1}{2}$ (B) $-\frac{1}{3}$ (C) $-\frac{1}{9}$ (D) $\frac{1}{9}$ $\boxed{\text{(E) } \frac{1}{3}}$

$$f(x) = -x^3 + x + \frac{1}{x} = -x^3 + x + x^{-1}$$

$$f'(x) = -3x^2 + 1 - 1x^{-2}$$

$$f'(-1) = -3(-1)^2 + 1 - 1(-1)^{-2} = -3(1) + 1 - \frac{1}{(-1)^2} = -3 + 1 - \frac{1}{1} = -3 + 1 - 1 = -3$$

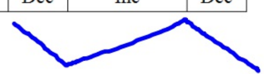
(A) 3 (B) 1 (C) -1 $\boxed{\text{(D) -3}}$ (E) -5

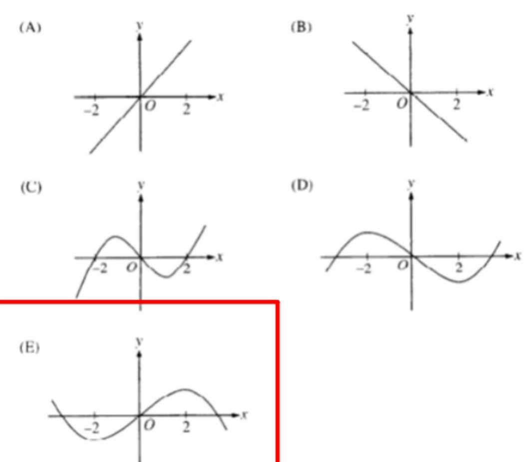


The graph of the derivative of *f* is shown in the figure above. Which of the following could be the graph of *f*?

min max

Critical points	-2		2
Sign of $f'(x)$	-	+	-
Behavior of $f(x)$	Dec	Inc	Dec





x-coordinate = 3

$$y - 2 = 5(x - 3)$$

$$y - 2 = 5x - 15$$

$$y = 5x - 15 + 2$$

$$\boxed{y = 5x - 13}$$

(A) $y = 2x - 11$ (B) $y = 2x + 5$ (C) $y = 5x - 17$ (D) $y = 5x + 2$ (E) $y = 5x + 13$

7. $\lim\limits_{x \to \infty} \dfrac{4 - x^2}{4x^2 - x - 2} =$

$$\lim_{x \to \infty} \frac{\cancel{4} - x^2}{4x^2 - \cancel{x} - \cancel{2}} = \lim_{x \to \infty} \frac{-x^2}{4x^2} = \frac{-1}{4}$$

(A) -2 (B) -¼ (C) 1 (D) 2 (E) Nonexistent

$$13 = x^2 + 4 \qquad 29 = x^2 + 4$$

$$9 = x^2 \qquad 25 = x^2$$

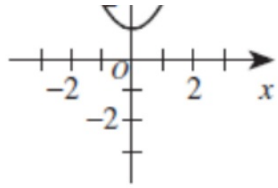
$$3 = x \qquad 5 = x$$

$\boxed{\text{(A) } 3 \le x \le 5}$ (B) $5 \le x \le 21$ (C) $9 \le x \le 25$ (D) $13 \le x \le 29$ (E) $173 \le x \le 845$

9. If $\sqrt{-1} = i$, which of the following is equivalent to $2i(4-6i)$?

$$2i(4-6i) = 8i - 12i^2 = 8i - 12\left(\sqrt{-1}\right)^2 = 8i - 12(-1) = 8i + 12$$

$\boxed{\text{(A) } 8i + 12}$ (B) $8i - 12$ (C) $12 - 8i$ (D) $8 - 12i$ (E) $8 + 12i$



The figure above most closely resembles the graph of which of the following functions?

Parabola (x^2) shifted up 1 (+ 1) → x^2+1

(A) $-x^2+1$ $\boxed{\text{(B) } x^2+1}$ (C) x^2-1 (D) $2x^2$ (E) x^3-1

Pg 199

#1, 2, 3, 5–9,

11, 13, 16, 17, 21, 25