

CALCULUS

Write your questions here!

Calculator is always in RADIANS!

CALCULATOR TIPS

1. Use the calculator when it is faster
2. Justify your calculator work on Free Response
3. Do NOT round until the very end
4. Round/Truncate to 3 decimal places

$$x = 43.58277289$$

$$x = -0.49927438$$

Common Mistakes

Evaluate

$$f(x) = x^2 - 4 \text{ at } x = -3$$

$$f(x) = \frac{x}{2\pi} \text{ at } x = 7$$

$$f(x) = x^9 - 4 \text{ at } x = 47$$

Trig Functions

Evaluate

$$f\left(\frac{\pi}{5}\right) = \csc \theta$$

$$f\left(\frac{2}{3\pi}\right) = \sin^2 \theta$$

Window, Trace, Table, ZStand and ZTrig

Evaluate

$$f(x) = x^2 - 4 \text{ at } x = 3.2$$

$$f(\theta) = \tan^{-1}(\theta) \text{ at } \theta = \pi$$

ZFit, Finding Extrema and Roots

Find all Max/Min

$$f(x) = x^4 - 3x^3 + x + 3$$

Find the zeros

$$f(x) = x^4 - 3x^3 + x + 3$$

Finding Point of Intersection

Solve

$$y = x^3 + 3x - 4$$
$$y = -x^2 + 4$$

Solve Equations

Solve

$$x^3 + 3x - 4 = 5$$

STORE and RECALL

If $x = \sin\left(\frac{\pi}{7}\right)$, find $3^x - 2\sqrt{x} - 4x$

$$f(x) = x^4 + 3x - 4$$
$$f(x) = -x^2 + 4$$

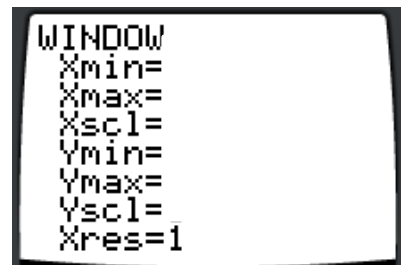
The x coordinate of the left point of intersection is A .
The x coordinate of the right point of intersection is B .

Find $A + B$

Window for Word Problems

Methane is produced in a cave at the rate of $r(t) = e^{\sin\left(\frac{\pi}{4}t\right)}$ liters per hour at time t hours. The initial amount of methane in the cave at time $t = 0$ is 20 liters. At $t = 8$ hours, a pump begins to remove the methane at a constant rate of 1.5 liters per hour.

At what time t during the time interval $0 \leq t \leq 8$ hours is the amount of methane increasing most rapidly?



SUMMARY:

Now,
summarize
your notes
here!





You are allowed to use a graphing calculator for 1-21



Find all extrema and roots for each function.

1. $y = -\frac{9}{10}x^3 - \frac{3}{4}x^2 + 2x + 1$

Maximum Point(s) =

Minimum Point(s) =

Root(s) =

2. $f(x) = \frac{e^x - 1}{x^2 - 4}$

Maximum Point(s) =

Minimum Point(s) =

Root(s) =

Solve the systems of equations by graphing.

5. $y = -\ln(2x - 1) + 3$
 $y = e^{\frac{2}{3}x} - 2$

6. $y = \sqrt{x^2 - 4}$
 $y = \tan^{-1}(x) + 3$

Evaluate the function at the given point.

9. $f(x) = e^{x^2 - 1}$ at $x = e$

10. $y = \sec(x) + 5x$ at $x = \frac{\pi}{5}$

11. $f(x) = 3x\sqrt{x^2 + 5}$ at $x = \pi$

12. $y = 2\sin^2(x) + \tan(2x)$ at $x = \frac{\pi}{3}$

Use the STORE feature to evaluate the following.

13. STORE $x = \cot\left(\frac{\pi}{9}\right)$ and use RECALL to find
 $\sqrt{x} + \ln(2x) - e^x$

14. STORE $x = e^\pi$ and use RECALL to find
 $4x - 2\sqrt{x^2 + 1} + 2^x$

15. Solve the system of equations below. STORE the x coordinate of the left point of intersection as A . STORE the x coordinate of the right point of intersection as B .

$y = \sin^2(x^2) + 1$
 $y = -|2x + 1| + 2.5$

Use RECALL to find $A - B$

16. STORE the x coordinate of the maximum point as A . STORE the x coordinate of the minimum point as B .

$y = -\frac{2}{5}x^3 - 2x^2 + x + 7$

Use RECALL to find $A - B$



You are allowed to use a graphing calculator for 1-4



MULTIPLE CHOICE

- Find the value of x for which the graphs of $f(x) = \frac{1}{2}e^{x-4}$ and $g(x) = 3\sqrt[3]{x}$ have $f(x) = g(x)$.
 - 1.761
 - 0.35
 - 2.134
 - 5.451
 - 6.389

- Find the minimum value of the function $f(x) = \ln(x) + \sin(x)$ on the interval $\left[\frac{\pi}{4}, \frac{9\pi}{4}\right]$.
 - 0.465
 - 0.526
 - 0.785
 - 1.145
 - 1.605

- If $f(x) = -\frac{x^2}{x^3-8}$, how many values of c such satisfy the condition $f(c) = 0$?
 - 0
 - 1
 - 2
 - 3
 - 4

- Which of the following statements about the function $y = x^3(3-x)$ is true?
 - The function has an absolute maximum.
 - The function has an absolute minimum.
 - The function has a relative minimum.
 - I only
 - II only
 - III only
 - I and II
 - I and III

