

Calculator Practice Problems

Give each answer to at least three significant digits (that means zeros at the end of big numbers, and zeros at the beginning of decimals smaller than 1, don't count as digits).

1. Evaluate $\frac{2x-5}{\sqrt{x^3-10}}$ for $x = \pi$

2. Evaluate $\frac{2}{3x}$ for $x = \frac{1}{\sqrt{10}}$.

3. Evaluate 5^{x+7} for $x = -\sqrt[3]{50}$.

4. Evaluate $\sqrt[5]{2x^2+99}$ for $x = 11.4$.

5. Evaluate $\frac{50x-8}{.03x}$ for $x = 0.023$.

6. Evaluate $\frac{5-.02x}{2\sqrt[3]{x+1}}$ for $x = -123,456,789$.

7. Evaluate 15^{2x-7} for $x = 9.4519190761$.

8. Evaluate $\left(\frac{3}{4}\right)^{3x-8}$ for $x = 27.742743892$.

9. Find the minimum value of $600x - 2,000,000x^3$ between $x = -1$ and $x = 0$.

10. For what value of x between $x = 0$ and $x = 1$ does the expression $600x - 2,000,000x^3$ reach a maximum?

11. Find:

(a) all solutions to $3x^4 + 13x^3 - 388x^2 + 1300x - 5,000 = 0$

(b) the solution to $3x^4 + 13x^3 - 388x^2 + 1300x - 5,000 \geq 0$

(c) the maximum value of $3x^4 + 13x^3 - 388x^2 + 1300x - 5,000$ between $x = 0$ and $x = 5$.

12. Make a table of the values of $x^5 - 15x^4 + 85x^3 - 225x^2 + 274x - 119$ for all the integer values of x from 1 to 10.

13. Make a table for the values of the same expression as in #12, where x runs from 1 to 10 in increments of 0.5.

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14. For the same expression as in #12 and #13:
- (a) What value of x gives a maximum value for the expression between $x=1$ and $x=2$?
 - (b) What is the minimum value of the expression between $x=4$ and $x=5$?
 - (c) Solve $x^5 - 15x^4 + 85x^3 - 225x^2 + 274x - 119 < 0$.
 - (d) Solve $x^5 - 15x^4 + 85x^3 - 225x^2 + 274x - 119 > 200$.
 - (e) Solve $x^5 - 15x^4 + 85x^3 - 225x^2 + 274x - 119 < x^2 + 500$.
15. Find the value of x which maximizes $100 - |50 - x^2 - 6x|$ between $x = -10$ and $x = 10$.
16. Find the maximum value of $100 - |50 - x^2 - 6x|$ between $x = -10$ and $x = 10$.
17. Answer questions #15 and #16 for the expression $50 - |-x^2 - 6x|$.
18. For what values of x do the expressions $100 - |50 - x^2 - 6x|$ and $50 - |-x^2 - 6x|$ have the same value?
19. Find all x -intercepts between -20 and 20 for the graph of $y = \frac{3x^2 - 10}{x^2 - 16}$.
20. Solve $5^{.13x} = 5.13x$. There are two solutions: one in the interval $(0,1)$ and one greater than 10 .
21. Describe the shape of the graphs of $y = -3 + \sqrt{8x + 9 - x^2}$ and $y = -3 - \sqrt{8x + 9 - x^2}$ when the graphs are drawn together in the same plane, with the x - and y -scales equal.
22. Solve $10 - x^2 \geq x^2 - 11x + 4$
23. As x increases from -4 , the expression $\sqrt{2x^3 - 5x^2 - 83x - 50}$ eventually becomes undefined (i.e., the calculator gives you an error). Between what two integers does this happen? As x continues to increase, between which two consecutive integers does the expression once again become defined?

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Answers

1. 0.280
2. 2.11
3. 208
4. 3.24
5. -9928
6. -2479
7. 100,000,000,000,000
8. 0.000000000399
9. -4
10. 0.01
11. (a) -15.2 and 8.13
(b) $(-\infty, -15.2]$ and $[8.13, \infty)$
(c) -3800

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12. (a):

1	1
2	1
3	1
4	1
5	1
6	121
7	721
8	2521
9	6721
10	15121

(b):

1	1
1.5	4.28
2	1
2.5	-0.406
3	1
3.5	2.41
4	1
4.5	-2.28
5	1
5.5	30.5
6	121
6.5	326
7	721
7.5	1409
8	2521
8.5	4224
9	6721
9.5	10257
10	15121

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14. (a) 1.356
(b) -2.63
(c) $(-\infty, 0.962)$, $(2.21, 2.72)$, and $(4.15, 4.95)$
(d) $(6.24, \infty)$
(e) $(-\infty, 6.81)$
15. 4.68
16. 100
17. (a) two answers: -6 and 0 .
(b) 50
18. All numbers in the interval $[-6, 0]$.
19. -1.83 and 1.83 .
20. 0.203 and 22.75.
21. It's a circle (although the calculator will probably show it broken into an upper and a lower half).
22. $[-0.5, 6]$
23. (a) between -1 and 0 .
(b) between 8 and 9.