

11. * Since "zeros" or "x-intercepts" are in 4 out of 5 choices, find zeros by setting $f(x) = 0$

Factors $(x)(x)(x+20)(x-20)$

4 zeros (x^4) : $x=0$ $x=0$ $x=-20$ $x=20$

Start w/GCF $0 = x^4 - 400x^2$

$0 = x^2(x^2 - 400)$

technically factors $0 = x^2(x+20)(x-20)$

$x \cdot x \cdot (x+20)(x-20)$

only 1 x-int
real sol.
real
real zero, x-int
real zero, x-int

12. * X-int means plug zero in for y.

$0 = e^{x+40} - 49.1$

$49.1 = e^{x+40}$

$\Rightarrow \log_e 49.1 = x+40$

$\ln 49.1 = x+40$

$-40 + \ln(49.1) = x$

(x is in exponent, so we want to switch forms)

3. * plug in each!!

① when plug in zero, DOMAIN ERROR! (cancels out a + c as options)

② $\log(12) - \log(6) = \log(2)$

③ $\log(49) - \log(1) \neq \log(14)$ ✗

OR: ① condense: $\log\left(\frac{x^2}{x-6}\right) = \log(2x)$

② set insides equal $x^2 = 2x(x-6)$

③ solve $x^2 = 2x^2 - 12x$

$0 = x^2 - 12x$

$0 = x(x-12)$

$x=12$ is solution

14. * EXPAND: $\log_4\left(\frac{16}{x^4}\right)$ two pieces

$\log_4 16 - \log_4 x^4$

an actual #, calculator.

$2 - 4\log_4 x$

power rule

$x=12$ Not in Domain!

17. $-x + y = 2$

$x^2 + y^2 = 2$

cannot eliminate, different powers. use substitution.

15. * partial fractions means 2 separate fractions:

$\frac{2x}{(x+2)^2} = \frac{A}{x+2} + \frac{B}{(x+2)^2}$

get common den

$\frac{2x}{(x+2)^2} = \frac{A(x+2) + B}{(x+2)^2}$

set up equations: $2x = A(x+2) + B$

x equation: $2 = A$

constants: $0 = 2A + B$

because two factors were exact same, we added "2" to one fraction.

Question asked for "A" because that is num. of $x+2$

18. $\ln(x^2) = 2$

$2\ln x = 2$

do these have same solutions?

$(y-2) + y^2 = 2$

$(y-2)(y-2) + y^2 = 2$

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

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

$2y^2 - 4y + 2 = 0$

$2(y^2 - 2y + 1) = 0$

$(y-1)(y-1)$

$y = 1$

find domain of each

16. * 3 equations: SET UP MATRICES IN CALC.

To solve for x, y, z,

$A^{-1}B = \begin{bmatrix} \\ \\ \end{bmatrix}$

$\begin{bmatrix} 1 & -1 & 1 \\ -6 & 6 & -6 \\ -4 & 1 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 8 \\ 12 \\ -4 \end{bmatrix}$

A X B

NO SOLUTION (ERROR)

y would be second.

① $\ln(x^2) = 2$

$x^2 > 0$

inside bigger than zero

negative #'s + pos. #'s make that true.

② $2\ln(x) = 2$

$x > 0$

only pos #'s make that true.