

Task #6 - Find My (Algebraic) Mistake(s)

1 Solve $6x^2 - 17x = -12$ by Factoring.

$$\begin{array}{r} +12 \quad +12 \\ \hline 6x^2 - 17x + 12 = 0 \end{array}$$

$$(x-8)(x-9) = 0$$

$$x-8=0 \quad x-9=0$$

$$\boxed{x=8} \text{ or } \boxed{x=9}$$

$$\begin{array}{c|c} \ominus & \oplus \\ \hline 72 & -17 \\ -8, -9 & \checkmark \end{array}$$

2 Write $3x^2 - 12x + 24 = 0$ in Vertex Form.
Then, identify the Vertex + Axis of Symmetry.

$$3(x^2 - 4x + 8) = 0$$

$$3(x^2 - 4x + \underline{4}) = -8 + 4$$

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

$$3(x-2)^2 + 4 = 0$$

$$\text{Vertex: } \boxed{(-2, 4)}$$

$$\text{Axis of Sym: } \boxed{-2}$$

(Hint: There are 3 mistakes in this problem.)

3 Determine if $\frac{-x}{x^2-4}$ is even, odd, or neither.

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

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

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

$$= \frac{+x}{x^2-4}$$

$$= \frac{x}{-x^2+4}$$

\therefore $\boxed{\text{Neither}}$

4 Find $\lim_{x \rightarrow 3} \frac{x^2-9}{x^2-6x+9} = \lim_{x \rightarrow 3} \frac{-9}{-6x+9}$

$$= \frac{-9}{-6(3)+9} = \frac{-9}{-18+9} = \frac{-9}{-9} = \boxed{1}$$

5 Convert 540° to radians.

$$\frac{540^\circ}{1} \cdot \frac{\pi}{180^\circ}$$

$$\Rightarrow \pi = 97200$$

$$540^\circ = \boxed{97200 \pi}$$

6 The the coterminial angle of $\frac{35\pi}{12}$ in $[0, 2\pi)$.

$$\frac{35\pi}{12} - 2\pi = \frac{33\pi}{12} - 2\pi = \frac{31\pi}{12}$$

$$\frac{31\pi}{12} - 2\pi = \frac{29\pi}{12} - 2\pi = \frac{27\pi}{12} - 2\pi = \frac{25\pi}{12}$$

$$\frac{25\pi}{12} - 2\pi = \boxed{\frac{23\pi}{12}}$$

7 Evaluate $\lim_{x \rightarrow 0} \frac{x^3 - x}{x}$.

$$= \frac{(0)^3 - (0)}{(0)} = \frac{0 - 0}{0} = \boxed{\frac{0}{0}}$$

8 Evaluate $\lim_{x \rightarrow 1} \frac{x^3 - 1}{x - 1}$.

$$= \lim_{x \rightarrow 1} \frac{(x-1)(x^2 - x + 1)}{(x-1)} = 1^2 - 1 + 1 = \boxed{1}$$

9 Evaluate $\lim_{x \rightarrow 0} \frac{(\sqrt{x+1} - 1) \cdot (\sqrt{x+1} + 1)}{x \cdot (\sqrt{x-1} + 1)}$

$= \lim_{x \rightarrow 0} \frac{-1}{x(\sqrt{x-1} + 1)} = \frac{-1}{0} \Rightarrow \boxed{\text{DNE}}$ IDK $\frac{1}{2}$

10 Find $\lim_{t \rightarrow 0} \frac{6 - \frac{1}{t}}{3 + \frac{1}{t}} \cdot \frac{(t)}{(t)}$

$= \lim_{t \rightarrow 0} \frac{6 - t/t}{3 + t/t} = \frac{6-1}{3+1} = \boxed{\frac{5}{4}}$

11 Find all roots of $x^3 - x^2 - 5x - 3 = 0$.

Upon further inspection in my calculator, it looks like $x = 3$ is one of the roots! So...

$$\begin{array}{r} 3 \mid 1 \quad -1 \quad -5 \quad -3 \\ \quad \downarrow \quad 3 \quad 6 \quad 3 \\ \hline 1 \quad 2 \quad 1 \quad 0 \end{array}$$

$\Rightarrow 1x^2 + 2x + 1 = (x+1)(x+1)$

$\boxed{x = -3}$ and $\boxed{x = 1}$?

12 Write the linear factorization of the polynomial function with roots of 3 (multiplicity of 2) and -5 (mult. of 3).

$\boxed{(x+3)^2(x-5)^3}$

13 Write the polynomial function with roots 3 and $i-1$.

↑
also $i+1$!!

Step 1:

$$\begin{array}{c} i \quad -1 \\ \begin{array}{|c|c|} \hline i^2 & -i \\ \hline i & -1 \\ \hline \end{array} = i^2 - 1 \end{array}$$

Step 2:

$$\begin{array}{c} i^2 \quad -1 \\ x \quad \begin{array}{|c|c|} \hline i^2 x & -x \\ \hline -3i & +3 \\ \hline \end{array} \\ -3 \end{array}$$

Step 3:

$$\begin{aligned} i^2 x - x - 3i + 3 \\ = -x - x - 3i + 3 \\ = \boxed{-2x - 3i + 3} \end{aligned}$$

Maybe?!
I tried... !!

14 Solve $3 - 5(2)^{3x} = -14$

$$-2(2)^{3x} = -14$$

$$2^{3x} = 7$$

$$\log_2 7 = 3x$$

$$\boxed{0.936 = x}$$

15 Solve $\log_3(x+4) - \log_3(x-5) = 2$

$$x+4 - (x-5) = 2$$

$$9 \neq 2$$

No Solution

This is so slight!!