

Answer on Question #56640 – Math – Algebra

13. According to the fundamental theorem of algebra, how many zeros does the polynomial below have.
 $f(x) = x^5 - 12x^3 + 7x - 5$

Solution

The Fundamental Theorem of Algebra states that every polynomial function of positive degree with complex coefficients has at least one complex zero.

Polynomials always have as many roots as their order. This is a 5th order polynomial- hence 5 roots!

Answer: 5.

14. If you know that $7 - \sqrt{5}$ is a root of a polynomial function, then the name given to $7 + \sqrt{5}$, which is another root of that same function, is the radical _____?

Answer: conjugate $7 + \sqrt{5}$.

15. Give the equation of the horizontal asymptote of the function shown below.
 $g(x) = \frac{2x}{x + 5}$

- A: $x=2$
- B: $y= \frac{2}{5}$
- C: $y = 2$
- D: $y = -5$

Solution

Let $y = kx + b$ be the equation of the horizontal asymptote. Then

$$k = \lim_{x \rightarrow \infty} \frac{f(x)}{x}$$

$$k = \lim_{x \rightarrow \infty} \frac{2 \cdot \frac{x}{x+5}}{x} = 0$$

$$b = \lim_{x \rightarrow \infty} (f(x) - kx)$$

$$b = \lim_{x \rightarrow \infty} 2 \cdot \frac{x}{x+5} - 0 \cdot x = \lim_{x \rightarrow \infty} \frac{2 \cdot x}{x+5} = 2$$

Answer: C: $y=2$.