

Answer on question #35091 – Math – Calculus

Trace the curve $y = -2x(x+1)^2$, stating all properties used for doing so.

Answer

- 1) Domain and range of this function is all \mathbb{R} ;
- 2) The graph of this function intersects the axis at the points:

x-axis:

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

$$x = 0 \text{ and } x = -1$$

y-axis:

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

We get two points $(0; 0)$ and $(-1; 0)$;

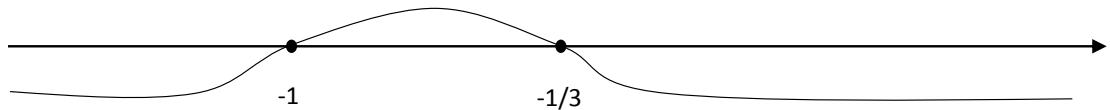
- 3) Critical points

$$y' = (-2x^3 - 4x^2 - 2x)' = -6x^2 - 8x - 2 = 0$$

$$3x^2 + 4x + 1 = 0$$

$$D = 16 - 12 = 4$$

$$x_1 = \frac{-4 - 2}{6} = -1; \quad x_2 = \frac{-4 + 2}{6} = -\frac{1}{3}$$



The function decrease on the interval $(-\infty; -1) \cup \left(-\frac{1}{3}; +\infty\right)$;

The function increase on the interval $(-1; -1/3)$.

The function has local minimum at the point $(-1; 0)$ and the local maximum at the point $\left(-\frac{1}{3}; \frac{8}{27}\right)$.

- 4) This function has no asymptotes.

The graph of this function:

