

1. Sketch the graph of $y = 1 - 6x^{-2} + 4x^{-3}$ by computing y' and y'' , and determining their signs and the corresponding shapes; finding the critical points, the inflections points, the intercepts, and the asymptotes; and clearly labeling them in the picture.

$$y' = 12x^{-3} - 12x^{-4} = 12x^{-4} \cdot (x-1) = 0 \Rightarrow x=1 \Rightarrow y=-1$$

$$y'' = -36x^{-4} + 48x^{-5} = -36x^{-5} \cdot (x - \frac{4}{3}) = 0 \Rightarrow x = \frac{4}{3} \Rightarrow y = -\frac{11}{16}$$

$$y=0 \Rightarrow 1 - 6x^{-2} + 4x^{-3} = 0 \Rightarrow x^3 - 6x + 4 = 0 \Rightarrow (x-2)(x^2 + 2x - 2) = 0 \Rightarrow x=2, x=-1 \pm \sqrt{3}$$

x	0	1	$\frac{4}{3}$
y'	-	0	+
y''	-	+	-

$$\lim_{x \rightarrow \infty} y = 1, \lim_{x \rightarrow -\infty} y = 1$$

$$\lim_{x \rightarrow 0^+} y = \infty, \lim_{x \rightarrow 0^-} y = -\infty$$

