AP Calculus AB
Curve Sketching

Complete the following table. Sketch the functions based on the information for the table.

Function	$y = 3x^4 + 4x^3$	$y = \frac{x^2 - 2x + 4}{x - 2}$	$y = 3x^{\frac{2}{3}} - 2x$	$y = \frac{\cos x}{1+\sin x}$ for $[0, 2\pi)$
x-intercept(s)/zeros	$(0,0)$ $(-4/3, 0)$	none	$(0,0)$ & $(27/8, 0)$	$(\pi/2, 0)$
y-intercept	$(0,0)$	$(0,-2)$	$(0,0)$	$(0,1)$
Vertical Asymptotes	none	$x = 2$	none	$x = \frac{3\pi}{2}$
Horizontal Asympt.	none	none (slant asymptote $y=x$)	none	none
First Derivative	$12x^3 + 12x^2$	$\frac{x(x-4)}{(x-2)^2}$	$2x^{-1/3} - 2$	$\frac{-1}{1+\sin x}$
Critical numbers	$x = 0, -1$	$x = 0, 2, 4$	$x = 0, 1$	$x = \frac{3\pi}{2}$

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Interval(s) increasing	$(-1,\infty)$	$(-\infty,0)$ & $(4,\infty)$	$(0,1)$	nowhere
Interval(s) decreasing	$(-\infty,-1)$	$(0,2)$ & $(2,4)$	$(-\infty,0)$ & $(1,\infty)$	$(0,3\pi/2) \cup (3\pi/2,2\pi)$
Extrema	rel. min at $(-1,-1)$	rel. min $(4,6)$ rel. max $(0,-2)$	rel. min $(0,0)$ rel max $(1,1)$	none
Second Derivative	$36x^2+24x$	$\frac{8}{(x-2)^3}$	$\frac{-2}{3\sqrt[3]{x^4}}$	$\frac{\cos x}{(1+\sin x)^2}$
Concave Up	$(-\infty,-\frac{2}{3})$ & $(0,\infty)$	$(2,\infty)$	nowhere	$(0,\pi/2)$ & $(\frac{3\pi}{2},2\pi)$
Concave Down	$(-\frac{2}{3},0)$	$(-\infty,2)$	$(-\infty,\infty)$	$(\frac{\pi}{2},\frac{3\pi}{2})$
Possible Points of Inflection	$(-\frac{2}{3},-\frac{16}{27})$ $(0,0)$	no POI -- there's a V.A. at $x=2$	none	$(\frac{\pi}{2},0)$

On graph paper, make a sketch of each function using the information you found.