For each of these functions:

- find where the first derivative changes (or could) change signs (set numerator and denominator of first derivative = 0)
- find where the second derivative changes (or could) change signs (set numerator and denominator of second derivative = 0)
- make a sign chart showing the signs of the first and second denominator in the given interval
- make a rough sketch of the shape of the graph
- find the y-coordinates and tell the local maxima and local minima and the inflection points
- find the absolute maximum and minimum of each function on the interval (don't forget to find the y-coordinates of the endpoints--sometimes those are absolute max or mins)

410. $f(x) = x^{2/3}(x-7)$ [-6,4]

411. $g(x) = 2\sin x \cos x - x$ * $[0, 2\pi]$

412. $h(x) = x + 2\sin x$ $[0, 2\pi]$

413. $y = \dfrac{10x}{2x^2+3}$ [-5,5]

414. $y = x^4 - 3x^3 + x^2 - 2$ [-2,3]

*This is different from what I wrote on the board in class. While I'll give credit for a correct answer to either one, I made a sign error when making up the problem originally, and that one doesn't have the nice answers this one does.

Answer bank for maxima, minima and points of inflection

(0, 0)	(0, 0)	(0, 0)	(0,0)
(0,-2)	$(2,-6)$	$(2,-6)$	(-2, 42)
(2.8, 8.34)	(-1.4, -10.51)	(-6, -42.93)	(π, π)
$(\pi, -\pi)$	$(2\pi, 2\pi)$		
$\left(\frac{2\pi}{3}, 3.83\right)$	$\left(\frac{4\pi}{3}, 2.46\right)$	$\left(\frac{5\pi}{6}, -3.48\right)$	$\left(\frac{7\pi}{6}, -2.80\right)$
$\left(\frac{\pi}{2}, -\frac{\pi}{2}\right)$	$\left(\frac{3\pi}{2}, -\frac{3\pi}{2}\right)$	$\left(\frac{11\pi}{6}, -6.63\right)$	$\left(\frac{11\pi}{6}, -6.63\right)$
$\left(\frac{1}{4}, -1.98\right)$	$\left(\sqrt{\frac{3}{2}}, 2.04\right)$	$\left(\sqrt{\frac{3}{2}}, 2.04\right)$	$\left(-\sqrt{\frac{3}{2}}, -2.04\right)$
$\left(-\sqrt{\frac{3}{2}}, -2.04\right)$	$\left(\frac{3}{\sqrt{2}}, 1.77\right)$	$\left(-\frac{3}{\sqrt{2}}, -1.77\right)$	$\left(\frac{9-\sqrt{57}}{12}, -1.99\right)$
$\left(\frac{9+\sqrt{57}}{12}, -4.35\right)$	$\left(\frac{\pi}{6}, 0.34\right)$	$\left(\frac{\pi}{6}, 0.34\right)$	