For Problems 31-35, see the Mathematica .nb files for details.

31) Critical numbers: $x = \frac{(5/3)^{2/5}}{2^{4/5}} \approx 0.704556$ Absolute Max & Local Max

$x \approx 1.74364$ Absolute Min & Local Min

End Points: $x = 0$ Local Min

$x = 2$ Local Max

[Note: I am able to classify these by viewing the graph in Mathematica. That is how I do all 4 of the next problems.]

$f(0) = 16$

$f(.7046) = 56.2$

$f(1.74364) = 1.5 \times 10^{-9}$ ← This is not 0 because of round off error. If we used more digits in the 1.74... part we would get zero here.

$f(2) = (-12 + 5\sqrt{2})^2 \approx 24.3$

[Note: The "//N" in the Mathematica file forces the output to be a numerical answer (i.e. 1.4142... instead of $\sqrt{2}$ or 3.1459... instead of π)]

[Note: The $\mathbb{I}$ symbol in Mathematica indicates a Complex (not Real) number. We ignore those critical numbers.]

32) Critical numbers: $x = -4.03749$ Local Max + Absolute Max
$x = -0.95933$ Local Min
$x = 1.0521$ Local Max
$x = 2.94473$ Local Min

Endpoints: $x = -6$ Absolute Min + Local Min
$x = 4$ Local Max

$f(-6) = -1836/5 = -367.2$
$f(-4.03) = 88.6$
$f(-0.9593) = -7.63689$
$f(1.0521) = 8.1428$
$f(2.944) = -72.23$
$f(4) = 592/15 = 39.47$

33) Critical Numbers $x = 16/19 \approx .842$ X Not in range we consider in this problem

$f(4) = 0$
$f(2) = -13.9$
$f(6) = 33.5$

$x = 4$ Neither a max nor min. Note that $f'(x)$ does not change sign at $x=4$.

End Points $x = 2$ Absolute + Local Min
$x = 6$ Absolute + Local Max

34) Critical Points $x = -3$ Local Min + Absolute Min
$x = 0$ Neither Max nor Min ($f'(x)$ does not cross the x-axis at $x=0$)

End Points $x = -4$ Local Max
$x = 2$ Local Max

$f(-3) = -1.344$
$f(0) = 0$
$f(-4) = -1.1722$
$f(2) = 59.11$

Note: Instead of "//N" you can use a decimal point to ask mathematica for the decimal representation of your answer. For example, try f[2] vs. f[2.] or f[2.0]

35) Critical Numbers $x = 0.664751$ Local Max
$x = 0.824935$ Local Min
$x = 0.939484$ Local Min
$x = 1.07166$ Local Min
$x = 1.40921$ Local Max + Absolute Max
$x = 1.51047$ Local Min
$x = 1.55872$ Local Max

End Points $x = 0$ Local Min + Absolute Min
$x = \pi/2 = 1.57\ldots$ Local Min

$f(0.664751) = 2.93747$
$f(0.824935) = 2.54239$
$f(0.939484) = 2.76393$
$f(1.07166) = 2.2359$
$f(1.40921) = 5.21567$
$f(1.51047) = 4.55689$
$f(1.55872) = 4.65191$
$f(0) = 0$
$f(\pi/2) = 4.63271$