LECTURE NOTES: 4-5 CURVE SKETCHING (PART 2)

WARM UP PROBLEM Find your copy of the Graphing Guidelines!

PRACTICE PROBLEMS

1. Sketch the curve $y = x - 2\sin x$ on $[-2\pi, 2\pi]$.

   (a) Find the domain.

   (b) Find the x and y-intercepts.

   (c) Find the symmetries/ periodicity of the curve.

   (d) Determine the asymptotes.

   (e,f) Determine where the function is increasing/ decreasing and find the local maximum/ minimum values

(g) Find the intervals of concavity/inflection points.

(h) Sketch the curve.

2. Sketch the graph of $f(x) = \dfrac{3x^2}{x^2+4}$

(a) Find the domain.

(b) Find the x and y-intercepts.

(c) Find the symmetries/ periodicity of the curve.

(d) Determine the asymptotes.

(e,f) Determine where the function is increasing/ decreasing and find the local maximum/ minimum values

(g) Find the intervals of concavity/inflection points.

(h) Sketch the curve.

3. Sketch the graph of $f(x) = x\sqrt{4 - x^2}$

(a) Find the domain.

(b) Find the x and y-intercepts.

(c) Find the symmetries/ periodicity of the curve.

(d) Determine the asymptotes.

(e,f) Determine where the function is increasing/ decreasing and find the local maximum/ minimum values

(g) Find the intervals of concavity/inflection points.

(h) Sketch the curve.

4. Sketch the curve $y = \dfrac{x}{\sqrt{9 + x^2}}$

(a) Find the domain.

(b) Find the x and y-intercepts.

(c) Find the symmetries/ periodicity of the curve.

(d) Determine the asymptotes.

(e,f) Determine where the function is increasing/ decreasing and find the local maximum/ minimum values

(g) Find the intervals of concavity/inflection points.

(h) Sketch the curve.

5. Sketch the curve $y = \dfrac{x^3 + 4}{x^2}$

   (a) Find the domain.

   (b) Find the x and y-intercepts.

   (c) Find the symmetries/ periodicity of the curve.

(d) Determine the asymptotes. (Try to find the slant asymptote. That is, what *line* does this function approach as $x \to \pm\infty$?)

(e,f) Determine where the function is increasing/ decreasing and find the local maximum/ minimum values

(g) Find the intervals of concavity/inflection points.

(h) Sketch the curve.