1. absolute is global, local is within an interval.

2. Extreme value theorem, find $f'(c) = 0$ or DNE, then use closed ~~value~~ interval method

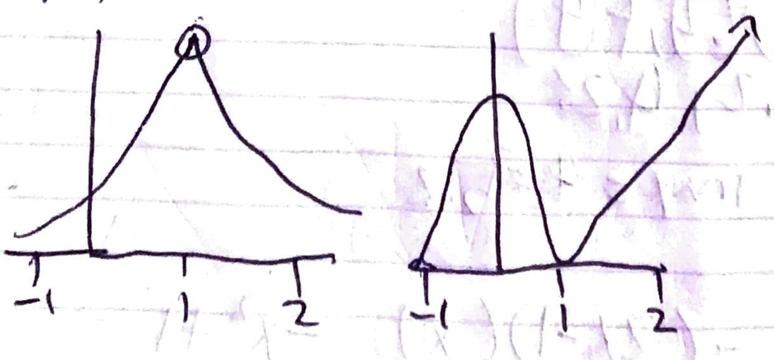
3. a. local maximum b. local min c. nothing d. nothing
r. global min s. global max

4. a. global min b. DNE c. DNE r. global max. s. local min

5. global max = 5, local min 2, 3
global min DNE local max DNE

6. global max DNE local max, 4, 3
global min : 1 local min, DNE

~~7~~.
12,



47.

$y' = 4 - 2x$ endpoints: $f(0), f(5)$

$= 12, = 7$

crit: $x = 2$

$f(2) = 16$

min: 7 max: 16

48/49.

$6x^2 - 6x - 12 = 0$

$\cancel{6x^2 - 6x = 12}$ $6(x+1)(x-2)$

$\cancel{x^2 - x = 2}$ crit $= -1, 2$

$\cancel{x^2 - x + .5^2 = 2}$ $f(-2), f(-1), f(2), f(3)$

$\cancel{(x-.5)(x+.5) - 2 = 0}$ $-3, 2, -19, -8$

min $= -19$ max $= 2$

53.

$f'(x) = 1 - x^{-2}$

$\times f(0), f(1), f(.2), f(4)$

n/A, 2, 5.2, 4.25

min = 2 max = ~~4~~ 5.2

54

$\frac{x^2 - x + 1 - (2x-1)(x)}{(x^2-x+1)^2}$ $\frac{-x^2+1}{(x^2-x+1)^2}$

$f(1), f(0), f(3)$ min = 0

1 0 $\frac{3}{7}$ max = 1

55.

$f(x) = x\sqrt{4-x^2}$

$f'(x) = \sqrt{4-x^2} + \frac{-1x}{2\sqrt{4-x^2}}$

~~critical: 0, 2~~

$f(0), f(2), f(-1)$

$0 \quad 0 \quad -\sqrt{3}$

min $= -\sqrt{3}$

max $= 0$

$\frac{-1x}{2\cdot\sqrt{4-x^2}} = \sqrt{4-x^2}$

$4-x^2 = \frac{x^2}{4(4-x^2)}$

$-x^2+4 = -4x^2+16$

$\sqrt{4-x^2}\,(1+$

56. $\sqrt[3]{t}\,(8-t)$

$\left(\frac{t}{3}\right)^{-\frac{2}{3}}(8-t) + -\sqrt[3]{t}$

$\frac{3^{\frac{2}{3}}(8-t) - \sqrt[3]{t}}{t^{\frac{2}{3}}} = 0$

57. $2\cos t + \sin t$

$-2\sin t + \cos t$

$f\left(\frac{\pi}{4}\right), f(0), f\left(\frac{\pi}{2}\right)$

$\sqrt{2}-1 \quad 2 \quad 0$

min $= 0$

max $= 2$

60. oh wait num

$x - \ln x$

min $= f\left(\frac{1}{2}\right)$ max $= f(2)$

61 $\ln(x^2+x+1)$

$\frac{2x+1}{x^2+x+1}$

$\frac{-1 \pm \sqrt{1+4}}{2}$

$f(.5)\ f\left(\frac{\sqrt{3}-1}{2}\right)$

$f(-1)$

$f(1)$

$\frac{-1 \pm \sqrt{3}}{2}$

.366