

HW16

17 Sept 2020

- 4) Express the base 10 # 420 as a signed binary number. How many bits are required to do so?

$$420/2 = 210$$

$$210/2 = 105$$

$$105/2 = 52.5$$

$$52/2 = 26$$

$$26/2 = 13$$

$$13/2 = 6.5$$

$$6/2 = 3$$

$$3/2 = 1.5$$

$$1/2 = 0.5$$

remainder	
n	0
n	0
y	1
n	0
n	0
y	1
n	0
y	1
y	1

0110100100
↑
positive
10 bits

5) $f(x) = \frac{5x}{(1-2x^2)^2}$

- a) Evaluate at $x = 0.423$ using 3-digit arithmetic w/ chopping

$$\frac{5(0.423)}{(1-2(0.423^2))^2} = \frac{2.115}{(1-2(0.178))} = \frac{2.115}{0.644} = 3.284$$

$$f_{\text{chopped}}(0.423) = 3.09 \quad f_{\text{true}}(0.423) = 5.12918$$

$$\text{error} = f_{\text{true}} - f_{\text{chopped}} = 0.03918$$

$$b) \frac{5(0.423)}{(1-2(0.423^2))^2} = \frac{2.115}{(1-2(0.1789))^2} = \frac{2.115}{0.4124} = 5.129$$

$$\text{error} = f_{\text{true}} - f_{\text{chopped}} = 0.01342$$