MATH 104 TUTORIAL 9 ANSWERS

1.a. 2

b. $\frac{3\pi}{4}$

c. $\sqrt{3}$

d. $\frac{\pi}{2}$

2.a.

$a_1 = 1, a_2 = \frac{1}{2}, a_3 = \frac{\left(\frac{1}{2}\right)}{3} = \frac{1}{6}, a_4 = \frac{\left(\frac{1}{6}\right)}{4} = \frac{1}{24}, a_5 = \frac{\left(\frac{1}{24}\right)}{5} = \frac{1}{120}, a_6 = \frac{1}{720}, a_7 = \frac{1}{5040}, a_8 = \frac{1}{40,320},$
$a_9 = \frac{1}{362,880}, a_{10} = \frac{1}{3,628,800}$

b.

$a_1 = -2, a_2 = \frac{1 \cdot (-2)}{2} = -1, a_3 = \frac{2 \cdot (-1)}{3} = -\frac{2}{3}, a_4 = \frac{3 \cdot \left(-\frac{2}{3}\right)}{4} = -\frac{1}{2}, a_5 = \frac{4 \cdot \left(-\frac{1}{2}\right)}{5} = -\frac{2}{5}, a_6 = -\frac{1}{3},$
$a_7 = -\frac{2}{7}, a_8 = -\frac{1}{4}, a_9 = -\frac{2}{9}, a_{10} = -\frac{1}{5}$

3. $a_n = \frac{2^{n-1}}{3(n+2)}, n = 1, 2, \ldots$

4.a   converges

b.   converges

c.   diverges

d.   converges

e.   converges