

Name: *Solutions*

Section: 11 12 13

1. Find  $\int_0^1 \frac{1}{x^{1/2}} dx$ .

*disc. at  $x=0$   
improper*

$$= \lim_{t \rightarrow 0^+} \int_t^1 x^{-1/2} dx$$

$$= \lim_{t \rightarrow 0^+} \left. \frac{x^{1/2}}{1/2} \right|_t^1$$

$$= \lim_{t \rightarrow 0^+} [2 \cdot 1 - 2 \cdot \sqrt{t}]$$

$$= 2$$

2. Write the first four terms **and** find the limit of the sequence  $\left\{ \frac{3n^2}{4n^2 - 7} \right\}_{n=2}^{\infty}$

$$n=2: \frac{3 \cdot 4}{4 \cdot 4 - 7}$$

$$\lim_{n \rightarrow \infty} \frac{3n^2}{4n^2 - 7}$$

$$n=3: \frac{3 \cdot 9}{4 \cdot 9 - 7}$$

$$= \lim_{n \rightarrow \infty} \frac{3}{4 - 7/n^2}$$

$$n=4: \frac{3 \cdot 16}{4 \cdot 16 - 7}$$

$$= \frac{3}{4 - 0}$$

$$n=5: \frac{3 \cdot 25}{4 \cdot 25 - 7}$$

$$= \frac{3}{4}$$