Problem Set # 9

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1.a

$$\lim_{k\to\infty} \frac{a_k}{k} = a_k * \lim_{k\to\infty} \frac{1}{k} = a_k * Divergent \therefore \text{ Divergent}$$

1.b $\sum_{k=1}^{\infty} \sqrt{a_k}$

$a_k = \dfrac{1}{k^2}$ $\qquad\qquad\qquad \dfrac{1}{\sqrt{k^2}}$

$\qquad\qquad\qquad\qquad\qquad \dfrac{1}{k} = Divergnet$

$a_k = \dfrac{1}{k^3}$ $\qquad\qquad\qquad \dfrac{1}{k^3}$

$\qquad\qquad\qquad\qquad\qquad \dfrac{1}{k^{3/2}} \quad \therefore \text{ Convergent bc p-series}$

Not enough information to tell

1.c $\sum_{k=1}^{\infty} \sin(a_k)$

$a_k > 0$

$\lim_{k\to\infty} \sin(a_k) = \sin(c) \ c \neq 0 \therefore Divergent$