

$$(a \cdot b)^x = a^x \cdot b^x$$

$$3^x \cdot 3^x = (3 \cdot 3)^x$$

$$3^{2x} = (3^2)^x = 9^x$$

B.3

33) $f_1(x) = 3^x$, $f_2(x) = \sqrt{9^x + 2^x}$, $f_3(x) = \sqrt{9^x - 4^x}$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{9^x + 2^x}}{3^x}$$

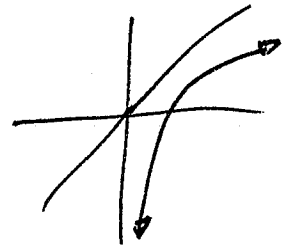
$$\lim_{x \rightarrow \infty} \sqrt{1 + \frac{2^x}{9^x}}$$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{9^x + 2^x}}{\sqrt{9^x}}$$

$$\lim_{x \rightarrow \infty} \sqrt{1 + \left(\frac{2}{9}\right)^x} = 1$$

$$\lim_{x \rightarrow \infty} \sqrt{\frac{9^x + 2^x}{9^x}}$$

$$\lim_{x \rightarrow \infty} \sqrt{\frac{9^x}{9^x} + \frac{2^x}{9^x}}$$



ii) $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{x^6 + x^2}}{x^2} \rightarrow \lim_{x \rightarrow \infty} \frac{\sqrt[3]{x^6}}{x^2} \rightarrow \lim_{x \rightarrow \infty} \frac{x^2}{x^2} = 1$

29) e^x , x^x , $(\ln x)^x$, $e^{x/2}$

$$\lim_{x \rightarrow \infty} \frac{e^x}{x^x} \rightarrow \lim_{x \rightarrow \infty} \left(\frac{e}{x}\right)^x = 0$$

$$\lim_{x \rightarrow \infty} \frac{(\ln x)^x}{x^x} \rightarrow \lim_{x \rightarrow \infty} \left(\frac{\ln x}{x}\right)^x = 0$$

$$\lim_{x \rightarrow \infty} \frac{e^{x/2}}{x^x} \rightarrow \lim_{x \rightarrow \infty} \left(\frac{e^{1/2}}{x}\right)^x = 0$$