

1.

$$(1) \frac{3}{8} \quad (2) \frac{e^2 + 1}{4} \quad (3) \log 2 + \frac{\pi}{3}$$

$$(4) \frac{\sqrt{2}}{8} - \frac{\pi}{32} - \frac{1}{16}$$

2.

$$(1) \quad x = \sqrt{e} \text{ のとき } \text{最大値} \quad \frac{1}{2}e^{\frac{1}{4}}$$

$$(2) \quad \left(e^{\frac{1}{2}}, e^{-\frac{1}{4}}\right) \quad (e^{-1}, e^{-1})$$

3.

$$(1) \frac{1}{2} \quad (2) \left(\frac{\sqrt{5}-1}{\sqrt{5}+1}\right)^{n-1} \quad (3) \frac{5+3\sqrt{5}}{10}\pi$$