

$$\textcircled{1} \text{ c) } \frac{\frac{1}{x} - \frac{1}{5}}{\frac{1}{x^2} - \frac{1}{25}}$$

$$\frac{5-x}{5x} \div \frac{25-x^2}{25x^2}$$

$$\frac{5-x}{5x} \times \frac{25x^2}{25-x^2}$$

$$\frac{\cancel{25}x^2(5-x)}{\cancel{5}x(\cancel{25-x^2})}$$

$$\frac{5x(\cancel{5-x})}{(5+x)(\cancel{5-x})}$$

$$\boxed{\frac{5x}{5+x}}$$

$$\textcircled{2} \frac{9-x^{-2}}{3+x^{-1}}$$

$$\frac{(\cancel{3+x^{-1}})(3-x^{-1})}{(\cancel{3+x^{-1}})}$$

$$3-x^{-1}$$

$$\frac{3-\frac{1}{x}}{1} \cdot \frac{x}{x}$$

$$\boxed{\frac{3x-1}{x}}$$

$$\textcircled{3} \text{ c) } \frac{a\left(\frac{\partial}{b}\right)}{\frac{3}{a}}$$

$$\frac{\partial a}{b} \cdot \frac{a}{3}$$

$$\frac{\partial a^2}{3b}$$

$$\frac{\partial a^2}{\partial b^{-1}}$$

$$\textcircled{3} d) \frac{ab-a}{b^2-b}$$

$$\frac{a(\cancel{b-1})}{b(\cancel{b-1})}$$

$$\boxed{ab^{-1}}$$

$$\textcircled{3} e) \frac{a^{-1}}{b^{-1}\sqrt{a}}$$

$$\frac{a^{-1}b}{a^{1/2}}$$

$$\boxed{a^{-3/2}b}$$

$$\textcircled{3} f) \left(\frac{a^{2/3}}{b^{1/2}}\right)^2 \cdot \frac{b^{3/2}}{a^{1/2}}$$

$$\frac{a^{4/3}b^{3/2}}{b^1a^{1/2}} \rightarrow \boxed{a^{5/6}b^{1/2}}$$

$$\frac{a^{4/3}a^{-1/2}}{b^1b^{-3/2}}$$

$$\frac{a^{5/6}}{b^{-1/2}}$$

$$\boxed{a^{5/6}b^{1/2}}$$

$$\textcircled{4} \text{ d), } \log_3 X^a = 2 \log_3 4 - 4 \log_3 5$$

$$\log_3 X^a = \log_3 16 - \log_3 625$$

$$\log_3 X^a = \log_3 \frac{16}{625}$$

$$X^a = \frac{16}{625}$$

$$X = \sqrt[4]{\frac{4}{25}}$$

$$\textcircled{5} \text{ b) } 2 \log_4 9 - \log_2 3$$

$$\log_4 81 - \log_2 3$$

$$\log_2 9 - \log_2 3$$

$$\log_2 \frac{9}{3}$$

$$\boxed{\log_2 3}$$

$$\ast 4^x = 81$$

$$(2^2)^x = 81$$

$$2^{2x} = 81$$

$$2^x = 9$$

$$\therefore \log_2 9 = \log_4 81$$

$$\textcircled{5} \text{ c) } 3^{2 \log_3 5}$$

$$3^{\log_3 25}$$

$$= 25$$

① a)  $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$  solve for a

$$\frac{x}{a} = 1 - \frac{y}{b} - \frac{z}{c}$$

$$\frac{x}{a} = \frac{bc - cy - bz}{bc}$$

$$a(bc - cy - bz) = bcx$$

$$a = \frac{bcx}{(bc - cy - bz)}$$

$$\textcircled{1}c) A = 2\pi r^2 + 2\pi rh \quad \text{for positive } r$$

$$0 = \underline{2\pi}r^2 + \underline{2\pi}rh - \underline{A}$$

$$a = 2\pi$$

$$b = 2\pi h$$

$$c = -A$$

$$r = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$r = \frac{-2\pi h \pm \sqrt{(2\pi h)^2 - 4(2\pi)(-A)}}{2(2\pi)}$$

$$r = \frac{-2\pi h \pm \sqrt{4\pi^2 h^2 + 8\pi A}}{4\pi}$$

$$r = \frac{-2\pi h \pm \sqrt{4(\pi^2 h^2 + 2\pi A)}}{4\pi}$$

$$r = \frac{-\cancel{2}\pi h \pm \cancel{2}\sqrt{\pi^2 h^2 + 2\pi A}}{\cancel{4}\pi}$$

$$r = \frac{-\pi h + \sqrt{\pi^2 h^2 + 2\pi A}}{2\pi}$$