①

$$510 = \frac{2(1-2^n)}{1-2}$$

$$-510 = 2 - 2.2^n$$

$$2.2^n = 512$$

$$2^n = 256$$

$$n = 8$$

②

$$\frac{a_1(1-r^{20})}{1-r} = 13 \quad -(1)$$

$$\frac{a_1(1-(-r)^{20})}{1-(-r)} = 17$$

$$\frac{a_1(1-r^{20})}{1+r} = 17 \quad -(2)$$

$$\frac{(1)}{(2)}; \quad \frac{13}{17} = \frac{\dfrac{\cancel{a_1(1-r^{20})}}{1-r}}{\dfrac{\cancel{a_1(1-r^{20})}}{1+r}}$$

$$\frac{13}{17} = \frac{1+r}{1-r}$$

$$13 - 13r = 17 + 17r$$

$$30r = -4$$

$$r = \frac{-4}{30} = \frac{-2}{15} \text{ ANS}$$

③

$$a_3 - a_1 = 3$$

$$\cancel{a_1} + 2d - \cancel{a_1} = 3$$

$$d = \frac{3}{2} \quad -*$$

$$a_1 + d = 10$$

$$2a_1 + \frac{3}{2} = 10$$

$$a_1 = \frac{17}{4} \quad -*$$

$$S_{40} = \frac{40}{2}\left[2\left(\frac{17}{4}\right) + (40-1)\frac{3}{2}\right]$$

$$= 20[8.5 + 58.5]$$

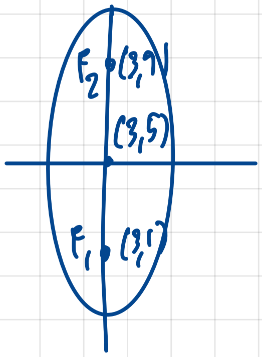
$$= 20(67)$$

$$= 1340 \text{ ANS}$$

④

⑤

$$\frac{(x-3)^2}{9} + \frac{(y-5)^2}{25} = 1$$



$$M = \frac{9-5}{3-0} = \frac{4}{3}$$

$$y - 9 = \frac{4}{3}(x-0)$$

$$3y - 15 = 4x$$

$$4x - 3y + 15 = 0$$

$$\text{ระยะ} = \frac{|4(3) - 3(1) + 15|}{\sqrt{4^2+3^2}} = \frac{24}{5} \text{ ANS}$$

6

$$(f\circ g)'(x) = 3x^2 + 1$$

$$(f\circ g)(x) = x^3 + x + C \quad -(1)$$

$$f(g(x)) = x^3 + x + C$$

$$f(x) = 3x + 1$$

$$\therefore f(g(x)) = 3(g(x)) + 1 \quad -(2)$$

$$(1) = (2); \quad 3g(x) + 1 = x^3 + x + C$$

$$x = 0; \quad 3(1) + 1 = 0 + 0 + C$$

$$C = 4$$

$$3g(x) + 1 = x^3 + x + 4$$

$$g(x) = (x^3 + x + 3)\frac{1}{3}$$

$$\int_0^1 g(x)\,dx = \frac{1}{3}\int_0^1 g(x)\,dx$$

$$= \frac{1}{3}\left(\frac{x^4}{4} + \frac{x^2}{2} + \frac{3x}{1}\right.$$

$$= \frac{1}{3}\left(\frac{1}{4} + \frac{1}{2} + 3\right)$$

$$= \frac{5}{4} \text{ ANS}$$

7).

$1 - x < -\frac{3}{7} < 7 - x$ $\downarrow +x$

$1 < -\frac{3}{7} + x < 7$

$+\frac{3}{7}$ $\downarrow$ $1\frac{3}{7} < x < 7\frac{3}{7}$ → มี 6 ตัว 2, 3, 4, 5, 6, 7

10) $N = \frac{8}{x+1} = \frac{(x+1)(0) - (8)(1)}{(x+1)^2}$

$= \frac{-8}{16}$.

$= -0.5$ ANS

11. $x^{\log_5 x^2} = \frac{25}{x^3}$

log $\downarrow$ $\log_5 x^{\log_5 x^2} = \log_5\left(\frac{25}{x^3}\right)$

$(\log_5 x^2)(\log_5 x) = \log_5 25 - \log_5 x^3$

$\log_5 x = a$ $2a^2 = 2 - 3a$

$2a^2 + 3a - 2 = 0$

$(2a-1)(a+2)$ 0

$a = \frac{1}{2}, -2$

$\log_5 x = \frac{1}{2}, -2$

$x = 5^{\frac{1}{2}}, 5^{-2}$

$x = \sqrt{5} \cdot \frac{1}{25}$

$\therefore \frac{\sqrt{5}}{25}$ ANS

⑫ กำไร 40%

ทุน 100 บาท ขาย = 140 บาท

ทุน 800 " " = 1120

ติดราคาเพื่อลด 50%

ราคาขาย 50 ติด 100 บาท

" —— " 1120 " 2240 บาท

ANS