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$f(x) = x^3 + ax^2 + bx - 16$, $f'(x) = 3x^2 + 2ax + b$

(1) $x=4$ is a local maximum and minimum $f'(4) = 0$ is necessary

for $f'(4) = 48 + 8a + b = 0 \dots ①$

for $f(4) = 64 + 16a + 4b - 16 = 0 \dots ②$

①, ② solve $a = -9, b = 24$

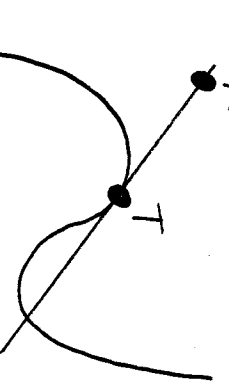
Therefore, since $x=4$ is a local maximum and minimum

$f'(x) = 3x^2 - 18x + 24$ $x \quad \dots \quad 2 \quad \dots \quad 4 \quad \dots$
 $= 3(x-2)(x-4)$ $\frac{f'(x)}{f(x)} \quad + \quad 0 \quad - \quad 0 \quad +$

for $x=2$, local minimum, $x=4$ is local maximum

Therefore, $a = -9, b = 24$, for $x=2$ is local minimum,

(2) $A(1,8)$



接点 (t, \quad)
 傾斜 $f'(t) = \quad$

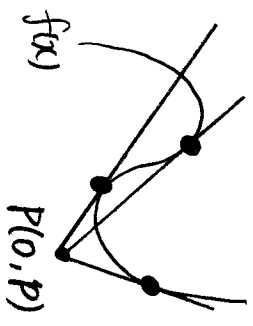
接線の式は

$y =$

Since $A(1,8)$ is on the curve, it satisfies

$t =$

for $x=2$, tangent line $y =$ for $x=4$ $y =$



Therefore, $f(x)$ has a tangent line at $P(0,p)$ is

$p =$

解

(31) -9 (a), 24 (b), 2 (c), 4 (d)
 (4~7) $y = (3t^2 - 18t + 24)x - 2t^3 + 9t^2 - 16$
 (2~3) $24x - 16$ ($t=2$) $-3x + 11$ ($t=4$) $-16 < p < 11$