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ALDEN LUTHFI A - KALKULUS C PR3

① $f(x) = 3x^4 - 8x^3 + 10$

$f'(x) = 12x^3 - 24x^2$

$= 12x^2(x - 2)$

$f''(x) = 36x^2 - 48$

$= 12x(3x - 4)$

ⓐ

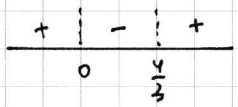
∴ $f(x)$ turun pada $(-\infty, 0) \cup (0, 2)$

$f(x)$ naik pada $(2, \infty)$

ⓑ hanya ada minimum lokal pada $x = 2$

ⓒ hanya ada minimum global pada $x = 2$

ⓓ



∴ $f(x)$ cekung keatas pada $(-\infty, 0) \cup (\frac{4}{3}, \infty)$

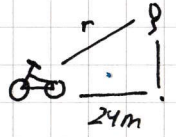
$f(x)$ cekung kebawah pada $(0, \frac{4}{3})$

ⓔ karena pangkat tenbesar genap maka $f(x) \to \infty$ saat $x \to \infty$ dan $x \to -\infty$

② ⓐ Setelah 3 detik :

→ balon berada 2/8 m dari titik awal

→ pesepeda berada 24m dari titik awal



$r^2 = 48^2 + 24^2$

$r = 24\sqrt{5}$

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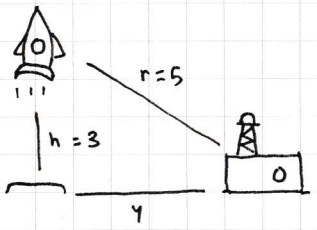
(3.)



dit. $\frac{dh}{dt}$ saat $h=3$

$\therefore \frac{dr}{dt} = 3600$

$r^2 = h^2 + 16$

jwb:

$$\frac{dh}{dt} = \frac{dh}{dr} \cdot \frac{dr}{dt}$$

$$2r\,dr = 2h\,dh$$

$$\rightarrow \frac{dh}{dr} = \frac{2r}{2h} = \frac{r}{h} = \frac{\sqrt{h^2+16}}{h}$$

$$\therefore \frac{dh}{dt} = \frac{5}{3} \cdot 3600 = 6000$$

$h=3$

(4.) V balok $= s^2 \cdot l = 13500 \rightarrow l = \frac{13500}{s^2}$

total material $= 4sl + s^2$

$$= s^2 + \frac{54000}{s} = L$$

$$L' = 2s - \frac{54000}{s^2} = 0$$

$s = 30$, $l = 15$

(5.)(a.) 4 kali / 15 menit $= 4^4$ kali / jam

$\therefore$ Setelah 3 jam $= 10.256^3$

(b.) $10^9 = 10.256^t$

$10^8 = 256^t$

$8 \ln 10 = t \ln 256$

$$t = \frac{8 \ln 10}{\ln 256} = 3.3219280\ldots \text{jam}$$