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KELAS : IF1A

Tugas 7

1. selesaikanlah:

$a. \lim_{x\to 0} \frac{x^2 + x^{-1} + 4}{x^4 - x^3 - 5}$

$$\lim_{x\to 0} \frac{x^2 + x^{-1} + 4}{x^4 - x^2 - 5} = \frac{0^2 + 0^{-1} + 4}{0^4 - 0^2 - 5} = -\frac{4}{5}$$

$b. \lim_{x\to \infty} \frac{2x^5 + x^4 - 7x^3}{6x^5 - 2x^3 + 8x^2}$

$$\lim_{x\to \infty} \frac{2x^5 + x^4 - 7x^3}{6x^5 - 2x^3 + 8x^2} = \lim_{x\to \infty} \frac{\frac{2x^5}{x^5} + \frac{x^4}{x^5} - \frac{7x^3}{x^5}}{\frac{6x^5}{x^5} - \frac{2x^3}{x^5} + \frac{8x^2}{x^5}}$$

$$= \lim_{x\to \infty} \frac{2 + \frac{1}{x} - \frac{7}{x^2}}{6 - \frac{2}{x^2} + \frac{8}{x^3}}$$

$$= \frac{2 + 0 - 0}{6 - 0 + 0}$$

$$= \frac{2}{6} = \frac{1}{3}$$

$c. \lim_{x\to \infty} \frac{x^{10} - 2x^8 + 3x^7}{x^{12} + 12x^5 + x^2}$

$$\lim_{x\to \infty} \frac{x^{10} - 2x^8 + 3x^7}{x^{12} + 12x^5 + x^2} = \lim_{x\to \infty} \frac{\frac{x^{10}}{x^{12}} - \frac{2x^8}{x^{12}} + \frac{3x^7}{x^{12}}}{\frac{x^{12}}{x^{12}} + \frac{12x^5}{x^{12}} + \frac{x^2}{x^{12}}}$$

$$= \lim_{x\to \infty} \frac{\frac{1}{x^2} - \frac{2}{x^4} + \frac{3}{x^5}}{1 + \frac{12}{x^7} + \frac{1}{x^{10}}}$$

$$= \frac{0 - 0 + 0}{1 + 0 + 0}$$

$$= \infty$$

$d.\ \lim_{x\to\infty} \frac{3x^7+6x^4-2}{2x^6+7x^4-x^3}$

$$\lim_{x\to\infty} \frac{3x^7+6x^4-2}{2x^6+7x^4-x^3} = \lim_{x\to\infty} \frac{\frac{3x^7}{x^7}+\frac{6x^4}{x^7}-\frac{2}{x^7}}{\frac{2x^6}{x^7}+\frac{7x^4}{x^7}-\frac{x^3}{x^7}}$$

$$= \lim_{x\to\infty} \frac{\frac{3}{x^4}+\frac{6}{x^3}-\frac{2}{x^7}}{\frac{2}{x}+\frac{7}{x^3}-\frac{1}{x^4}}$$

$$= \frac{3+0-0}{0+0-0}$$

$$= \infty$$

2. ubahlah menjadi pecahan biasa!

$a.\ 0{,}6666\ldots$

$10y = 6{,}6666\ldots$

$y = 0{,}6666\ldots$ —

$9y = 6$

$y = \frac{6}{9} = \frac{2}{3}$

$b.\ 0{,}242424\ldots$

$100y = 24{,}2424\ldots$

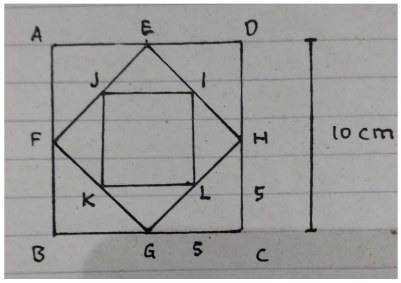
$y = \ 0{,}2424\ldots$ —

$99y = 24$

$y = \frac{24}{99} = \frac{8}{33}$

3. diketahui sebuah bujur sangkar dengan sisi 10cm. titik tengah keempat sisinya dihubungkan sehingga terbentuk bujur sangkar ke dua. Titik tengah keempat sisi bujur sangkar kedua dihubungkan lagi sehingga terbentuk bujur sangkar ketiga, demikian seterusnya. Hitunglah jumlah luas semua bujur sangkar itu!

Jawab



Luas bujur sangkar pertama, $L = s \times s = 10 \times 10 = 100\ cm^2$

Sisi bujur sangkar kedua?

Sisi bujur sangkar = sisi miring segitiga siku-siku sama kaki

$CG^2 + CH^2 = GH^2$

$5^2 + 5^2 = GH^2$

$25 + 25 = GH^2$

$GH = \sqrt{50}$

$GH = \sqrt{25} \times \sqrt{2}$

$GH = 5\sqrt{2}$

Sisi bujur sangkar kedua, $5\sqrt{2}\ cm$

Luas bujur sangkar kedua,

$L = s \times s$

$= 5\sqrt{2} \times 5\sqrt{2}$

$= 25 \times 2$

$= 50\ cm^2$

sisi bujur sangkar ketiga?

$GK^2 + GL^2 = KL^2$

$\left(\frac{5\sqrt{2}}{2}\right)^2 + \left(\frac{5\sqrt{2}}{2}\right)^2 = KL^2$

$\frac{25}{2} + \frac{25}{2} = KL^2$

$\frac{50}{2} = KL^2$

$KL = \sqrt{25}$

$KL = 5$

Sisi bujur sangkar ketiga, 5 cm

Luas bujur sangkar ketiga,

$L = s \times s$

$= 5 \times 5$

$= 25\ cm^2$

jumlah luas bujur sangkar $100 + 50 + 25 + \cdots$

$r = \frac{U_2}{U_{2-1}} = \frac{50}{100} = \frac{1}{2}$

$S = \frac{a}{1-r} = \frac{100}{1-\frac{1}{2}} = \frac{100}{\frac{1}{2}} = 100 : \frac{1}{2} = 100 \times \frac{2}{1} = 200\ cm^2$