1.) $\sum_{k=1}^{4} (k^2+3k) = \sum_{k=1}^{4} k^2 + \sum_{k=1}^{4} 3k$

$= \frac{4(4+1)\times(2\times4+1)}{6} + 3\times\frac{4(4+1)}{2}$

$= 30 + 30$

$= 60$ → Jawaban akhir

$\lim_{x \to 1} \frac{1-\sqrt{x}}{1-x^2} = \ldots$

$\lim \quad 2 - \sqrt{x+1} = \ldots$

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3.) $\lim_{x \to 1} \frac{1-\sqrt{x}}{1-x^2} = \frac{-\frac{1}{2\sqrt{x}}}{-2x}$

$= \frac{1}{2\sqrt{x}} \times \frac{1}{2x}$

$= \frac{1}{4x\sqrt{x}} = \frac{1}{4(1)\sqrt{1}} = \frac{1}{4}$ //

) $\lim_{x \to 3} \frac{2-\sqrt{x+1}}{x-3} = \frac{-\frac{1}{2\sqrt{x+1}}}{1} = -\frac{1}{2\sqrt{x+1}}$

$= -\frac{1}{2\sqrt{3+1}}$

$= -\frac{1}{2\sqrt{4}}$

$= -\frac{1}{4}$

$$\overline{\quad 4 \quad}$$

//

7.) $$\lim_{x \to 1} \frac{x^3 - x^2 - x + 1}{x - 2\sqrt{x} + 1} = \frac{3x^2 - 2x - 1}{1 - \frac{1}{\sqrt{x}}}$$

$$= \frac{3x^2 - 2x - 1}{\frac{\sqrt{x} - 1}{\sqrt{x}}}$$

$$= \frac{(3x^2 - 2x - 1)\sqrt{x}}{\sqrt{x} - 1}$$

$$= \frac{(3x^2 + x - 3x - 1)\sqrt{x}}{\sqrt{x} - 1}$$

$$= \frac{(x(3x+1) - (3x+1))\sqrt{x}}{}$$

$$= \frac{(3x+1) \cdot (}{\sqrt{}}$$

$$= (3x+1)$$

$$= (3x\sqrt{x} + 1$$

$$= 3x^2 + 3$$

$$= 3(1)^2 +$$

$$= 8$$

//

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9.) $\lim\limits_{x \to 4} \sqrt[3]{3x^2+7x-12} + \lim\limits_{x \to 5} \sqrt{3x^2-11-3x}$

•) $\lim\limits_{x \to 4} \sqrt[3]{3x^2+7x-12} = \sqrt[3]{\lim\limits_{x \to 4} (3x^2+7x-12)}$

$= \sqrt[3]{\lim\limits_{x \to 4} (3x^2+7x) - \lim\limits_{x \to 4} (12)}$

$= \sqrt[3]{\lim\limits_{x \to 4} (3x^2) + \lim\limits_{x \to 4} (7x) - 12}$

$= \sqrt[3]{3 \times \lim\limits_{x \to 4} (x^2) + 7 \times \lim\limits_{x \to 4} (x) - 12}$

$= \sqrt[3]{3 \times \left(\lim\limits_{x \to 4} (x)\right)^2 + 7 \times 4 - 12}$

$= \sqrt[3]{3 \times 4^2 + 7 \times 4 - 12}$

$= \sqrt[3]{48 + 28 - 12} = \sqrt[3]{64}$

$= 4$

//

$\lim\limits_{x \to 5} \sqrt{3x^2-11-3x} = \sqrt{\lim\limits_{x \to 5} (3x^2-11-3x)}$

$= \sqrt{\lim\limits_{x \to 5} (3x^2) - \lim\limits_{x \to 5} (11) - 3 \times \lim\limits_{x \to 5} (x)}$

$= \sqrt{3 \times \lim\limits_{x \to 5} (x^2) - 11 - 3 \times 5}$

$= \sqrt{3 \times 5^2 - 11 - 3\cancel{x}5}$

$= \sqrt{75 - 11 - 15} = \sqrt{49} = 7$ //

$\therefore 4 + 7 = 11$ //

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4) $\lim\limits_{x \to 4} \sqrt[3]{3x^2+7x-12} + \lim\limits_{x \to 5} \sqrt{3x^2-11-3x}$

•) $\lim\limits_{x \to 4} \sqrt[3]{3x^2+7x-12} = \sqrt[3]{\lim\limits_{x \to 4} (3x^2+7x-12)}$

$= \sqrt[3]{\lim\limits_{x \to 4} (3x^2+7x) - \lim\limits_{x \to 4} (12)}$

$= \sqrt[3]{\lim\limits_{x \to 4} (3x^2) + \lim\limits_{x \to 4} (7x) - 12}$

$= \sqrt[3]{3 \times \lim\limits_{x \to 4} (x^2) + 7 \times \lim\limits_{x \to 4} (x) - 12}$

$= \sqrt[3]{3 \times \left(\lim\limits_{x \to 4} (x)\right)^2 + 7 \times 4 - 12}$

$= \sqrt[3]{3 \times 4^2 + 7 \times 4 - 12}$

$= \sqrt[3]{48+28-12} = \sqrt[3]{64}$

$= 4$

//

•) $\lim\limits_{x \to 5} \sqrt{3x^2-11-3x} = \sqrt{\lim\limits_{x \to 5} (3x^2-11-3x)}$

$= \sqrt{\lim\limits_{x \to 5} (3x^2) - \lim\limits_{x \to 5} (11) - 3 \times \lim\limits_{x \to 5} (x)}$

$= \sqrt{3 \times \lim\limits_{x \to 5} (x^2) - 11 - 3 \times 5}$

$= \sqrt{3 \times 5^2 - 11 - 3 \times 5}$

$= \sqrt{75 - 11 - 15} = \sqrt{49} = 7$ //

$\therefore 4 + 7 = 11$ //

13.) $\lim_{x \to c} f(x) = 3, \lim g(x) = -5, \lim(g(x)^2) - 3f(x) = -5^2 - 3(3)$

$= 25 - 9$

$= 16$ //

15.) $\lim_{x \to 0} \dfrac{x^3 - 3x^2 + 6x}{x^2 + 2x} = \dfrac{3x^2 - 6x + 6}{2x + 2}$

$= \dfrac{3(0)^2 - 6(0) + 6}{2(0) + 2}$

$= \dfrac{6}{2} = 3$ //

17.) $\lim_{x \to \infty} \sqrt[3]{\frac{8x^2+1}{x^2+4}} = \sqrt[3]{\lim_{x \to \infty} \left(\frac{8x^2+1}{x^2+4}\right)}$

$= \sqrt[3]{\lim_{x \to \infty} \left(\frac{x^2 \times (8 + \frac{1}{x^2})}{x^2 \times (1 + \frac{4}{x^2})}\right)}$

$= \sqrt[3]{\lim_{x \to \infty} \left(\frac{8 + \frac{1}{x^2}}{1 + \frac{4}{x^2}}\right)} = \sqrt[3]{\frac{8+0}{1+4\times 0}} = \sqrt[3]{8}$

$= \sqrt[3]{8} = 2$

.) $\lim_{x \to \infty} x(x - \sqrt{x^2+16}) = (x^2 - x\sqrt{x^2+16})$

$= (x^2 - x\sqrt{x^2+16}) \times \frac{x^2 + x\sqrt{x^2+16}}{x^2 + x\sqrt{x^2+16}}$

$= \frac{(x^2 - x\sqrt{x^2+16}) \times (x^2 + x\sqrt{x^2+16})}{x^2 + x\sqrt{x^2+16}}$

$= \frac{4x^2 - x^2 \times (x^2+16)}{x^2 + x\sqrt{x^2+16}} = \frac{\cancel{x^4} - \cancel{x^4} - 16x^2}{x^2 + x\sqrt{x^2+16}}$

$x > 0$ $4\sqrt{x^2} + \sqrt{x}\,x$ $a\sqrt{x^2 -$

23.) $F(x) = \frac{15}{x^3}$, $f'(x) = \frac{-15 \times \frac{d}{dx}(x^3)}{(x^3)^2}$

$= -15 \times \frac{3x^2}{x^6}$

$= \frac{-45}{x^4}$

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25) $f(x) = \frac{3x^2+2}{\sqrt{x}}$ $\quad f'(x) = \frac{6x\sqrt{x} - 3x^2+2 \times \frac{1}{2\sqrt{x}}}{\sqrt{x}^2}$

$$= \frac{6x\sqrt{x} - \frac{3x^2+2}{2\sqrt{x}}}{\sqrt{x}^2}$$

$$= \frac{\frac{12x^2 - 3x^2 - 2}{2\sqrt{x}}}{x}$$

$$= \frac{9x^2-2}{2x\sqrt{x}} \rightarrow \frac{9(4)^2-2}{2(4)\sqrt{4}} = \cancel{\frac{9(16)-2}{16}}$$

$$= \frac{9 \times 16 - 2}{16} = \frac{144-2}{16} = \frac{142}{16} = \frac{71}{8}$$

22) $f(x) = -4x^3 + 3x^{-2} - 6$. $f'(-1) = -12x^2 + (-6x^{-3})$

$$= -12x^2 - \frac{6}{x^3}$$

$$= \frac{-12x^5 - 6}{x^3}$$

$$= \frac{-12(-1)^5 - 6}{(-1)^3} = -(-12(-1) - 6)$$

$$= -(12 - 6)$$

$$= -6$$ //

$(-1)^3$

29.) $f(u) = \dfrac{1}{4u^2-3}$. $f'(u) = -\dfrac{\frac{d}{du}(4u^2-3)}{(4u^2-3)^2}$

$$= \frac{-8u}{(4u^2-3)^2}$$