S 109

1) $2 \cdot (2x - \frac{1}{2}y)^5$

$$1(2x)^5(-\tfrac{1}{2}y)^0 + 5(2x)^4(-\tfrac{1}{2}y)^1 + 10(2x)^3(-\tfrac{1}{2}y)^2 + 10(2x)^2(-\tfrac{1}{2}y)^3 + 5(2x)^1(-\tfrac{1}{2}y)^4 + 1(2x)^0(-\tfrac{1}{2}y)^5$$

$$2 \cdot \left(32x^5 - 40x^4y + 20x^3y^2 - 5x^2y^3 + \tfrac{5}{8}xy^4 - \tfrac{1}{32}y^5\right)$$

$$64x^5 - 80x^4y + 40x^3y^2 - 10x^2y^3 + \tfrac{5}{4}xy^4 - \tfrac{1}{16}y^5$$

2) $(3i-2)^4 = 1(3i)^4(-2)^0 + 4(3i)^3(-2)^1 + 6(3i)^2(-2)^2 + 4(3i)^1(-2)^3 + 1(3i)^0(-2)^4$

$$81i^4 - 216i^3 + 216i^2 - 96i + 16$$

$$81 + 216i - 216 - 96i + 16 = -119 + 120i$$

$(1-2i)^4 = 1 \cdot 1^4(-2i)^0 + 4 \cdot 1^3(-2i)^1 + 6 \cdot 1^2(-2i)^2 + 4 \cdot 1^1(-2i)^3 + 1 \cdot 1^0(-2i)^4$

$$1 - 8i + 24i^2 - 32i^3 + 16i^4$$

$$1 - 8i - 24 + 32i + 16 = -7 + 24i$$

$(i+3)^2 = i^2 + 6i + 9 = 8 + 6i$

$(3i - 2^4) - 2 \cdot (i+3)^2 \cdot (1-2i)^4$

$(-119 + 120i) - 2 \cdot (8+6i) \cdot (-7+24i)$

$-2 \cdot 2(4+3i) \cdot (-7+24i) = -4 \cdot (-28 + 96i - 21i - 72)$

$\Rightarrow (-119 + 120i) - 4 \cdot (-100 + 75i) = -119 + 120i + 400 - 300i = 281 - 180i$

5) a) $360 = 2 \cdot 180 = 2 \cdot 2 \cdot 90 = 2 \cdot 2 \cdot 2 \cdot 45 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 15 = 2 \cdot 2 \cdot \boxed{2} \cdot 3 \cdot \boxed{3} \cdot 5$

$108 = 2 \cdot 54 = 2 \cdot 2 \cdot 27 = 2 \cdot 2 \cdot 3 \cdot 9 = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3$

$ggT(360, 108) = 2 \cdot 2 \cdot 3 \cdot 3 = 36$

$kgV(360, 108) = 2^3 \cdot 3^3 \cdot 5 = 8 \cdot 27 \cdot 5 = 1080$ → $108 \cdot 10$, → $360 \cdot 3$

b) $1260 = 2^2 \cdot 3^2 \cdot 5 \cdot 7$ $\qquad 1350 = 2 \cdot 3^3 \cdot 5^2$

$ggT(1260, 1350) = 2 \cdot 3^2 \cdot 5 = 90$

$kgV(1260, 1350) = 2^2 \cdot 3^3 \cdot 5^2 \cdot 7 = 18.900$

$$\frac{1}{54} + \frac{1}{72} = \frac{}{54 \cdot 72}$$

$54 \downarrow$ $\quad$ $72 \downarrow$

$27 \cdot 2$ $\qquad$ $36 \cdot 2$

$3^3 \cdot 2$ $\qquad$ $2^2 \cdot 3^2 \cdot 2$

$3 \cdot 3 \cdot 3 \cdot 2$ $\qquad$ $3 \cdot 3 \cdot 2 \cdot 2 \cdot 2$

$$= \frac{}{\underbrace{3 \cdot 3 \cdot 3 \cdot 2 \cdot 2 \cdot 2}_{27 \cdot 8 = 216}}$$

$27 \cdot 8 = 216 \nearrow$ kgV

$f(x) = x^3 - 2x^2 + 42$

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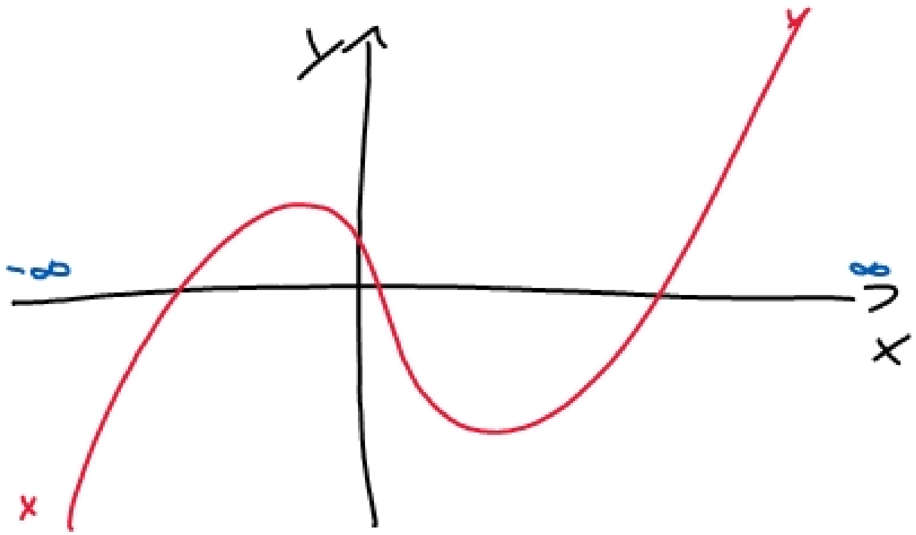
$\mathbb{D} = x \in \mathbb{R}$

$\mathbb{W} = y \in \mathbb{R}$

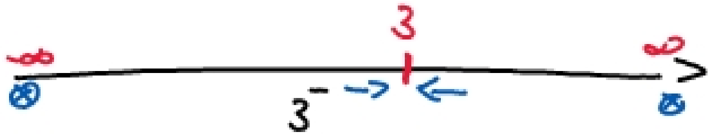


$\lim\limits_{x \to -\infty} f(x) = -\infty$

$\lim\limits_{x \to \infty} f(x) = \infty$

$$f(x) = 4 + \frac{2}{x-3} \quad ; \; D = x \in \mathbb{R} \setminus \{3\}$$

$$\boxed{\frac{K}{\infty} = 0 \; ; \; \frac{K}{0} = \infty}$$

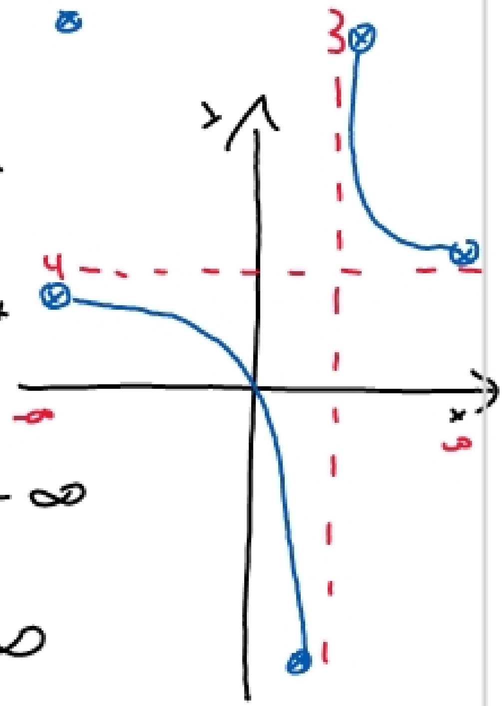


$$\lim_{x \to -\infty} f(x) = \left[4 + \frac{2}{-\infty}\right] = \left[4 + 0^-\right] = 4^-$$

$$\lim_{x \to \infty} f(x) = \left[4 + \frac{2}{\infty}\right] = \left[4 + 0^+\right] = 4^+$$

$$\lim_{x \to 3^-} f(x) = \left[4 + \frac{2}{3^- - 3}\right] = \left[4 + \frac{2}{0^-}\right] = -\infty$$

$$\lim_{x \to 3^+} f(x) = \left[4 + \frac{2}{3^+ - 3}\right] = \left[4 + \frac{2}{0^+}\right] = \infty$$



Hyperbel

$$W = y \in \mathbb{R} \setminus \{4\}$$