

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

$$2 \left( 1(2x)^5 \cdot 1 + 5(2x)^4 \left(-\frac{1}{2}y\right) + 10(2x)^3 \left(-\frac{1}{2}y\right)^2 + 10(2x)^2 \left(-\frac{1}{2}y\right)^3 + 5(2x) \left(-\frac{1}{2}y\right)^4 + 1 \cdot 1 \left(-\frac{1}{2}y\right)^5 \right)$$

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

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

$$2) \ (3i - 2)^4$$

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

$$81 + 216i - 216 - 96i + 16$$

$$-119 + 120i$$

$$(j+3)^2 = -1 + 6j + 9 = 8 + 6j$$

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

$$1 - 8j - 24 + 32j + 16$$

$$-7 + 24j$$

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

$$-119 + 120j - 4 \cdot (4 + 3j)(-7 + 24j)$$

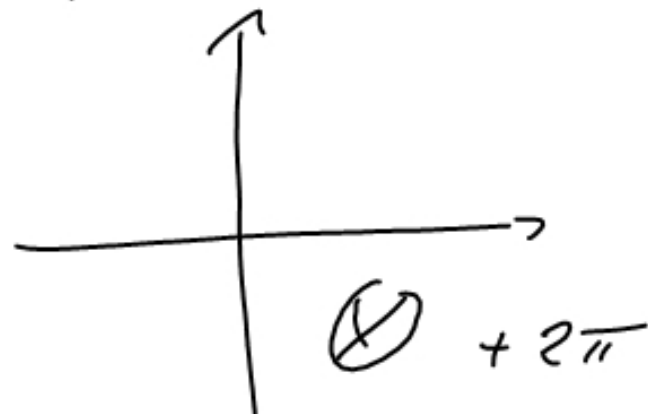
$$-119 + 120j - 4 \cdot (-28 + 96j - 21j - 72)$$

$$-119 + 120j - 4 \cdot (-100 + 75j)$$

$$-119 + 120j + 400 - 300j$$

$$\Rightarrow 281 - 180j$$

$$\begin{array}{l} (2j-3)^2 \\ -4 - 12j + 9 \\ 5 - 12j \end{array}$$



3)

$$f(x) = \frac{10 + 2x}{3\sqrt{6-2x} - 6\sqrt{9+x}}$$

$\nearrow$  II) =  $x \in [-9; 3] \setminus \{-5\}$   
 $\searrow$  Grenzwerte

$$6 - 2x = 0 \Leftrightarrow x = 3 \begin{cases} \nearrow x = 10 : 6 - 20 < 0 \\ \searrow x = 0 : 6 - 0 > 0 \Rightarrow x \leq 3 \end{cases}$$

$$9 + x = 0 \Leftrightarrow x = -9 \begin{cases} \nearrow x = 0 : 9 + 0 > 0 \Rightarrow x \geq -9 \\ \searrow x = -20 : 9 - 10 < 0 \end{cases}$$

$$3\sqrt{6-2x} - 6\sqrt{9+x} = 0$$

$$3\sqrt{6-2x} = 6\sqrt{9+x}$$

$$9 \cdot (6-2x) = 36 \cdot (9+x)$$

$$54 - 18x = 324 + 36x$$

$$-54x = 270$$

$$| : 6 \cdot \sqrt{9+x}$$

$$| \uparrow^2$$

$$| \sqrt{\quad}$$

$$1 - 54 - 36x$$

$$| : (-54)$$



$$x = -5$$