

$$1. \quad \omega(x) = 3x^5 - 8x^4 + 5x^3$$

$$\omega(x) = x^3 \underbrace{\left(3x^2 - 8x + 5 \right)}_{0,5 \text{ pt}} = 3x^3 \underbrace{\left(x-1 \right) \left(x-1\frac{2}{3} \right)}_{1 \text{ pt}}$$

$$\Delta = (-8)^2 - 4 \cdot 3 \cdot 5$$

$$\Delta = 64 - 60 = 4$$

$$\sqrt{\Delta} = 2$$

$$x_1 = \frac{8-2}{6} = 1$$

$$y = a \downarrow (x-x_1)(x-x_2)$$

$$y = \underbrace{3 (x-1) \left(x-1\frac{2}{3} \right)}_{0,5 \text{ pt}}$$

$$x_2 = \frac{8+2}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3} \quad 0,5 \text{ pt}$$

$$2. \quad \underbrace{10x^3 - 2x^2}_{\substack{\parallel \\ \downarrow}} + \underbrace{5x - 1}_{\substack{\parallel \\ \downarrow}} = 0$$

$$0,5 \text{ pkt} \quad 2x^2(5x - 1) + 1(5x - 1) = 0$$

$$0,5 \text{ pkt} \quad (5x - 1) \cdot (2x^2 + 1) = 0$$

\parallel
 \downarrow

$$5x - 1 = 0$$

$$5x = 1$$

$$\underbrace{x = \frac{1}{5}}_{0,5 \text{ pkt}}$$

\parallel
 \downarrow

$$\underbrace{2x^2 + 1}_{\substack{\parallel \\ \downarrow}} = 0$$

\parallel
 \downarrow
1

sp.ve.

0,5 pkt

$$3. \quad w(x) = x^3 + 3x^2 - 2x - 1$$

$$p(x) = x + 3$$

$$w(a)$$

$$x - a$$

$$w(-3) = (-3)^3 + 3 \cdot (-3)^2 - 2(-3) - 1 \quad 0,5 \text{ plit}$$

$$a = -3$$

$$w(-3) = -27 + 27 + 6 - 1$$

0,5 plit

$$w(-3) = 5$$

1 plit

4. $a = -2$ $w(x) = 2x^3 + 9x^2 + 13x + 6$

$x - a$

$x + 2$

0,5 plit

	x^3	x^2	x	
-2	2	9	13	6
		-4	-10	-6
	2	5	3	0
	x^2	x		

$w(x) = (x+2) \cdot (2x^2 + 5x + 3)$ 0,5 plit

$w(x) = 0$

$(x+2)(2x^2 + 5x + 3) = 0$ 0,5 plit

\Downarrow
 $x = -2$

\Downarrow
 $2x^2 + 5x + 3 = 0$

$\Delta = 5^2 - 4 \cdot 2 \cdot 3 = 25 - 24 = 1$

$\sqrt{\Delta} = 1$

$x_1 = \frac{-5 - 1}{4} = -\frac{6}{4} = -1\frac{1}{2}$

$x_2 = \frac{-5 + 1}{4} = -1$

$$5. \quad W(x) = 3x^5 + 2x^3 + 7x^2 - 2x - 12$$

$$P(x) = 3x^5 - 2x^4 + 3x^2 - 6x + 5$$

$$F(x) = W(x) - 2P(x)$$

$$F(x) = 3x^5 + 2x^3 + 7x^2 - 2x - 12 - 2(3x^5 - 2x^4 + 3x^2 - 6x + 5) \quad 0,5 \text{ pkt}$$

$$F(x) = 3x^5 + 2x^3 + 7x^2 - 2x - 12 - 6x^5 + 4x^4 - 6x^2 + 12x - 10 \quad 0,5 \text{ pkt}$$

$$F(x) = -3x^5 + 4x^4 + 2x^3 + x^2 + 10x - 22$$

0,5 pkt

$$\text{st } F(x) = 5 \quad 0,5 \text{ pkt}$$