1. $W(x) = x^5 - 5x^4 + 6x^3$

$W(x) = x^3 \underbrace{(x^2 - 5x + 6)}$

$W(x) = x^3 (x-2)(x-3)$

$\Delta = (-5)^2 - 4 \cdot 1 \cdot 6$

$\Delta = 25 - 24 = 1 \qquad \sqrt{\Delta} = 1$

$x_1 = \frac{-b - \sqrt{\Delta}}{2a} = \frac{5-1}{2} = 2$

$x_2 = \frac{-b + \sqrt{\Delta}}{2a} = \frac{5+1}{2} = 3$

$1x^2 - 5x + 6 = 1(x-2)(x-3)$

1° $\Delta > 0$ $y = \underbrace{a(x-x_1)(x-x_2)}$

2° $\Delta = 0$ $y = a(x-x_0)^2$

3° $\Delta < 0$ brak postaci iloczynowej

2. $\underbrace{14x^3 - 7x^2} + \underbrace{4x - 2} = 0$

$7x^2(2x-1) + 2(2x-1) = 0$

$(2x-1)\cdot(7x^2+2) = 0$

$\Downarrow \qquad \Downarrow$

$2x - 1 = 0 \qquad 7x^2 + 2 = 0$

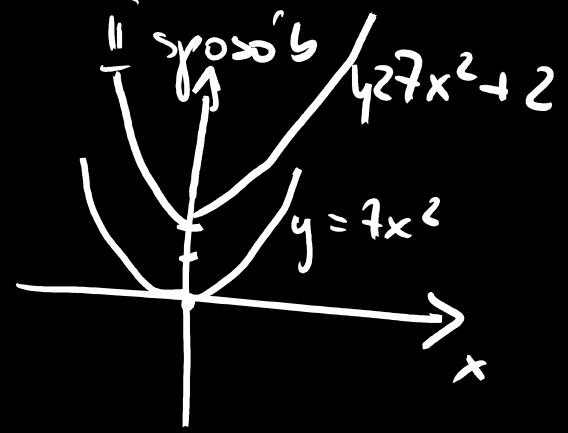
$2x = 1 \qquad 7x^2 = -2$

$\boxed{x = \frac{1}{2}} \qquad 0 < x^2 = -\frac{2}{7} < 0$

sprz. brak rozw.

$x \in \left\{\frac{1}{2}\right\}$

II sposób



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

$q(x) = x - 4$

$r(x) = ?$

$x - a$

$a = 4$

$w(a) = r$

$w(4) = 2 \cdot 4^3 + 4^2 + 4 - 1 = 2 \cdot 64 + 16 + 3 = 128 + 19 = 147$

4. $\underbrace{a = -2}_{\text{pierwiastek}}$

$$w(x) = 2x^3 + 8x^2 + 13x + 6$$

$$\underbrace{w(x)} = (x+2)(2x^2+5x+3)$$

st $w(x) = 3$

max 3 pierw.

$x - a$

$x - (-2)$

$(x + 2)$

$$\begin{array}{l}
2x^2 + 5x + 3 \\
\hline
(2x^3 + 8x^2 + 13x + 6) : (x+2) \\
-2x^3 - 4x^2 \\
\hline
= \quad 5x^2 + 13x + 6 \\
\quad -5x^2 - 10x \\
\hline
\quad = \quad 3x + 6 \\
\quad\quad -3x - 6 \\
\hline
\quad\quad = \quad =
\end{array}$$

$$w(x) = 0$$

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

$$\Downarrow \qquad \Downarrow$$

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

$$\underbrace{x=-2} \qquad \Delta = 5^2 - 4\cdot 2\cdot 3 = 25 - 24 = 1$$

$$x_1 = \frac{-5-1}{4} = \frac{-6}{4} = -\frac{3}{2} = -1\frac{1}{2}$$

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

pierwiastki $w(x)$:

$$-2,\ -1\tfrac{1}{2},\ -1$$

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

$P(x) = -2x^5 - 4x^4 + x^2 - 5x + 7$

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

$F(x) = (3x^5 + 2x^3 - 5x^2 + x - 12) - 2 \cdot (-2x^5 - 4x^4 + x^2 - 5x + 7)$

$F(x) = \underline{3x^5} + 2x^3 - 5x^2 + x - 12 + \underline{4x^5} + 8x^4 - 2x^2 + 10x - 14$

$F(x) = 7x^5 + 8x^4 + 2x^3 - 7x^2 + 11x - 26$

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