

Exercise 1

Exercise 1.

$$5a^2 \cdot 1.5a^4 - 3a^2 \cdot 6a^2 + a^3 \cdot (-4a^2) - a^2 \cdot (-a^2) - 12 \cdot (-3) =$$

$$= 7.5a^6 - 18a^4 - 4a^5 + a^4 + 36 = 7.5a^6 - 2a^3 - 4a^5 + a^4 + 36$$

Exercise 2

Exercise 2.

$$3x^3 + 2y + 4 \quad \text{при } y = 3x^3 + x - 5$$

$$\downarrow$$

$$3x^3 + 2(3x^3 + x - 5) + 4 = 3x^3 + 6x^3 + 2x - 10 + 4 = 9x^3 + 2x - 6$$

Exercise 3

$$4x - 1.5x + 7 + 1\frac{1}{4}x = 0$$

$$2.5x + 7 + 1\frac{1}{4}x = 0$$

$$2\frac{1}{2}x + 1\frac{1}{4}x + x = -7$$

$$2\frac{7}{14}x + 1\frac{2}{14}x + x = -7$$

$$x = 3\frac{9}{14}$$

Exercise 4

Exercise 4

$$p_1(b) = 12b^4 - 10b^2 + 7$$

$$p_2(b) = 1.4b^3 - 5b^4 + b + 1.2$$

$$\begin{aligned} a) \quad p(b) &= 2(12b^4 - 10b^2 + 7) + 1.4b^3 - 5b^4 + b + 1.2 \\ p(b) &= 24b^4 - 20b^2 + 14 + 1.4b^3 - 5b^4 + b + 1.2 \\ p(b) &= 19b^4 + 1.4b^3 - 20b^2 + b + 15.2 \end{aligned}$$

$$\begin{aligned} b) \quad p(b) &= 12b^4 - 10b^2 + 7 - 3(1.4b^3 - 5b^4 + b + 1.2) \\ p(b) &= 12b^4 - 10b^2 + 7 - 4.2b^3 + 15b^4 - 3b - 3.6 \\ p(b) &= 27b^4 - 4.2b^3 - 10b^2 - 3b + 4.6 \end{aligned}$$

Exercise 5

Exercise 5

$$\begin{aligned} 3a(5ab^3 - 3) + 5a^2b^2(3b - 2a) &= 15a(2ab^3 - 1) + 18 \\ 15a^2b^3 - 9a + 15a^2b^3 - 10a^3b^2 &= 30a^2b^3 - 15a + 18 \\ 30a^2b^3 - 9a - 10a^3b^2 &= 30a^2b^3 - 15a + 18 \\ -9a + 15a - 10a^3b^2 &= 18 \\ -10a^3b^2 + 6a &= 18 \quad | : 2 \\ -5a^3b^2 + 3a &= 9 \end{aligned}$$

I did not get the solution but I tried

Exercise 5.

$$3a(5a^2b^3 - 3) + 5a^2b^2(3b - 2a) = 15a(2ab^3 - 1) + 18$$

$$15a^2b^3 - 9a + 15a^2b^3 - 10a^3b^2 = 30a^2b^3 - 15a + 18$$

$$30a^2b^3 - 9a - 10a^3b^2 = 30a^2b^3 - 15a + 18$$

$$-9a + 15a - 10a^3b^2 = 18$$

$$6a - 10a^3b^2 = 18$$

$$-10a^3b^2 + 6a = 18$$

$$-5a^3b^2 + 3a = 9$$

$$\boxed{a(-5a^2b^2 + 3) = 9}$$

$$\begin{cases} a = 3 \\ 3 = 5(3)^2b^2 = 9 \end{cases}$$

$$\boxed{3 - 45b^2 = 3} \quad | :3$$

$$\begin{cases} a = 3 \\ -5(3^2)b^2 = 3 \end{cases}$$

$$1 - 15b^2 = 3$$

$$-15b^2 = 2 \quad b^2 = -\frac{2}{15} \quad b = \pm \sqrt{-\frac{2}{15}}$$

(Note: The handwritten work shows a contradiction where b^2 is both positive and negative, indicating no real solution exists.)

$$\begin{aligned}
 & \begin{cases} a=3 \\ -5(3)^2 b^2 = 3 \\ -5 \cdot 9 b^2 = 3 \\ -45 b^2 = 3 \\ -15 b^2 = 1 \\ b^2 = \pm \frac{1}{15} \\ b = \pm \frac{1}{\sqrt{15}} \end{cases} \\
 & (a-b)(a+b)^2 \\
 & = \cancel{(a-b)} \cancel{(a^2 - b^2)} \\
 & (a-b)(a+b)(a+b) = \\
 & = (a+b)(a^2 - b^2) \\
 & \left(2 - \frac{3a}{6}\right) \left(2 + \frac{3}{6}\right)^2
 \end{aligned}$$

Exercise 6

$$\begin{aligned}
 & \text{Exercise 6} \\
 & (90-1)^2 = 8100 + 1 - 180 = 7921 = 89^2 \\
 & (100+2)^2 = 10000 + 4 + 400 = 10404 = 102^2
 \end{aligned}$$

Exercise 7

$$\begin{aligned}
 & \text{Exercise 7} \\
 & (3x+2)(3x-2) - 32 = (9x-2)^2 \\
 & 9x^2 - 4 - 32 = 9x^2 - 36x + 36 \\
 & 9x^2 - 36 = 9x^2 - 36x + 36 \\
 & 36x = 72 \\
 & x = 2
 \end{aligned}$$

Exercise 8

Exercise 8.

при $a = \frac{1}{6}$

$$(2-3a)(4+6a+9a^2) = (2-3a)(2+3a)^2 = (2-3 \cdot \frac{1}{6})(2+3 \cdot \frac{1}{6})^2$$

$$= 1.5 \cdot 2.5^2 = 1.5 \cdot 6.25 = \frac{15^2 \cdot 25}{1000} = \frac{75}{8} = 9 \frac{3}{8} \quad \frac{15}{10}$$

$$= \frac{3}{2} \cdot \frac{25}{4} = \frac{75}{8}$$

Exercise 9

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$$(3b+2)^2 + (7+3b)(7-3b) - 12b =$$

$$= \underline{9b^2 + 12b} + 49 - 9b^2 - \underline{12b} =$$

$$= 53$$