

Harjoittele
S.83

37 Polynomin kertominen luvulla

462

$$\begin{aligned} \text{a) } & 5 \cdot (20+4) \\ & = 5 \cdot 24 \\ & = 120 \end{aligned}$$

$$\begin{aligned} \text{b) } & 5 \cdot (20+4) \\ & = 5 \cdot 20 + 5 \cdot 4 \\ & = 100 + 20 \\ & = 120 \end{aligned}$$

463

$$\begin{aligned} \text{a) } & 5 \cdot (40+5) \\ & = 5 \cdot 40 + 5 \cdot 5 \\ & = 200 + 25 \\ & = 225 \end{aligned}$$

$$\begin{aligned} \text{b) } & -4 \cdot (25-2) \\ & = -4 \cdot 25 - 4 \cdot (-2) \\ & = -100 + 8 \\ & = -92 \end{aligned}$$

464

$$\begin{aligned} \text{a) } & 2 \cdot (x+8) \\ & = 2 \cdot x + 2 \cdot 8 \\ & = 2x + 16 \end{aligned}$$

$$\begin{aligned} \text{b) } & 5 \cdot (x+6) \\ & = 5 \cdot x + 5 \cdot 6 \\ & = 5x + 30 \end{aligned}$$

$$\begin{aligned} \text{c) } & 10 \cdot (x+9) \\ & = 10 \cdot x + 10 \cdot 9 \\ & = 10x + 90 \end{aligned}$$

$$\begin{aligned} \text{d) } & 28 \cdot (x+1) \\ & = 28 \cdot x + 28 \cdot 1 \\ & = 28x + 28 \end{aligned}$$

465

$$\begin{aligned} \text{a) } & 3(4x+2) \\ & = 3 \cdot 4x + 3 \cdot 2 \\ & = 12x + 6 \end{aligned}$$

$$\begin{aligned} \text{b) } & 4(11x+6) \\ & = 4 \cdot 11x + 4 \cdot 6 \\ & = 44x + 24 \end{aligned}$$

$$\begin{aligned} \text{c) } & 7(2x^3-9) \\ & = 7 \cdot 2x^3 - 7 \cdot 9 \\ & = 14x^3 - 63 \end{aligned}$$

$$\begin{aligned} \text{d) } & 8(-2x^2+3x) \\ & = 8 \cdot (-2x^2) + 8 \cdot 3x \\ & = -16x^2 + 24x \end{aligned}$$

466

$$\begin{aligned} \text{a) } & 12(3x^2-5x+1) \\ & = 12 \cdot 3x^2 - 12 \cdot 5x + 12 \cdot 1 \\ & = 36x^2 - 60x + 12 \end{aligned}$$

$$\begin{aligned} \text{b) } & -9(9x^2+6x-8) \\ & = -9 \cdot 9x^2 - 9 \cdot 6x - 9 \cdot (-8) \\ & = -81x^2 - 54x + 72 \end{aligned}$$

$$\begin{aligned} \text{c) } & -7(-2x^2+5x-9) \\ & = -7 \cdot (-2x^2) - 7 \cdot 5x - 7 \cdot (-9) \\ & = 14x^2 - 35x + 63 \end{aligned}$$

467

$$\begin{aligned} \text{a) } & 2(12x-6) \\ & = 2 \cdot 12x - 2 \cdot 6 \\ & = 24x - 12 \end{aligned}$$

$$\begin{aligned} \text{b) } & 9(-9x-2) \\ & = 9 \cdot (-9x) + 9 \cdot (-2) \\ & = -81x - 18 \end{aligned}$$

$$\begin{aligned} \text{c) } & 2(-3x+8) \\ & = 2 \cdot (-3x) + 2 \cdot 8 \\ & = -6x + 16 \end{aligned}$$

$$\begin{aligned} \text{d) } & 8(-x-6) \\ & = -8 \cdot x - 8 \cdot 6 \\ & = -8x - 48 \end{aligned}$$

$$\begin{aligned} \text{e) } & 3(8x-4) \\ & = 3 \cdot 8x - 3 \cdot 4 \\ & = 24x - 12 \end{aligned}$$

$$\begin{aligned} \text{f) } & -4(-8x-5) \\ & = -4 \cdot (-8x) - 4 \cdot (-5) \\ & = 32x + 20 \end{aligned}$$

$$\begin{aligned} \text{g) } & -3(-13x-6) \\ & = -3 \cdot (-13x) - 3 \cdot (-6) \\ & = 39x + 18 \end{aligned}$$

$$\begin{aligned} \text{h) } & -12(2x+1) \\ & = -12 \cdot (-2x) - 12 \cdot 1 \\ & = 24x - 12 \end{aligned}$$

$$\begin{aligned} \text{i) } & -6(-4x+2) \\ & = -6 \cdot (-4x) - 6 \cdot 2 \\ & = 24x - 12 \end{aligned}$$

$$\begin{aligned} \text{j) } & -2(4x+24) \\ & = -2 \cdot 4x - 2 \cdot 24 \\ & = -8x - 48 \end{aligned}$$

Sovella
468

$$\begin{aligned} \text{a) } & -1 \cdot (x^2+3) \\ & = -1 \cdot x^2 - 1 \cdot 3 \\ & = -x^2 - 3 \end{aligned}$$

$$\begin{aligned} \text{b) } & -1 \cdot (-2x^2+6x-9) \\ & = -1 \cdot (-2x^2) - 1 \cdot 6x - 1 \cdot (-9) \\ & = 2x^2 - 6x + 9 \end{aligned}$$

$$\begin{aligned} \text{c) } & -(-x^2+7) \\ & = x^2 - 7 \end{aligned}$$

$$\begin{aligned} \text{d) } & -(5x^2+3x-1) \\ & = -5x^2 - 3x + 1 \end{aligned}$$

Sovella
S.83

37 Polynomin kertominen luvulla

469 a) $(6x-9) \cdot 7$
 $= 7(6x-9)$
 $= 7 \cdot 6x + 7 \cdot (-9)$
 $= 42x - 63$

b) $(x^2+3x+5) \cdot 11$
 $= 11(x^2+3x+5)$
 $= 11 \cdot x^2 + 11 \cdot 3x + 11 \cdot 5$
 $= 11x^2 + 33x + 55$

c) $2 \cdot 5(3x+6)$
 $= 10(3x+6)$
 $= 10 \cdot 3x + 10 \cdot 6$
 $= 30x + 60$

d) $(-x^2+8x) \cdot 2 \cdot 4$
 $= 8 \cdot (-x^2+8x)$
 $= 8 \cdot (-x^2) + 8 \cdot 8x$
 $= -8x^2 + 64x$

470 a) $\square \cdot (2x+3) = 4x + 6$ b) $\square \cdot (2x+3) = 20x + 30$

$$\begin{aligned}\square \cdot 2x &= 4x \\ \square \cdot 3 &= 6\end{aligned}$$

$$V: \square = 2$$

$$\begin{aligned}\square \cdot 2x &= 20x \\ \square \cdot 3 &= 30\end{aligned}$$

$$V: \square = 10$$

c) $\square \cdot (2x+3) = 10x + 15$

$$\square = \frac{15}{3} = \underline{\underline{5}}$$

d) $\square \cdot (2x+3) = 60x + 90$

$$\square = \frac{90}{3} = \underline{\underline{30}}$$

471 a) $\square \cdot (9x-3) = -9x+3$

$$\square = \frac{3}{-3} = \underline{\underline{-1}}$$

b) $\square \cdot (12x-18) = -6x+9$

$$\square = \frac{9}{-18} = -\frac{1}{2}$$

472 a) $3(\square) = 3y + 6$

$$\square = y + 2$$

b) $9(\square) = 18y + 36$

$$\square = 2y + 4$$

c) $-4(\square) = 8y^2 - 16$

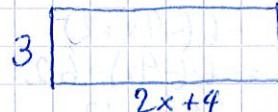
$$\square = 4y^2 + 4$$

d) $0,5(\square) = -4y^2 + 10$

$$\square = -8y^2 + 20$$

473 a) Pinta-ala = kanta · korkeus

$$\begin{aligned}A &= (2x+4) \cdot 3 \\ &= 3 \cdot (2x+4) \\ &= 3 \cdot 2x + 3 \cdot 4 \\ &= 6x + 12\end{aligned}$$



Piiri = Sivujen pituuksien summa

$$\begin{aligned}P &= 2 \cdot 3 + 2(2x+4) \\ &= 6 + 4x + \cancel{8} \\ &= 4x + 18\end{aligned}$$

b) $A = 4(x+5)$
 $= 4x + 20$



$$\begin{aligned}P &= 2 \cdot 4 + 2(x+5) \\ &= 8 + 2x + 10 \\ &= 2x + 18\end{aligned}$$