

1.2 Operace s algebr. výrazy (Testy 2017)

$$01) 2x + 3 - (7 - 3x) = \underline{\underline{2x + 3 - 7 + 3x = 5x - 4}}$$

$$02) (x - 5 - 3x) \cdot (1 - 2x) = x - 2x^2 - 5 + 10x - 3x + 6x^2 =$$

množit každý člen $= \underline{\underline{4x^2 + 8x - 5}}$

1. řádkový každý člen 2. řádkový

$$03) 3 \cdot (3b - 5) - 5 \cdot (2a - 3) =$$
$$= 9b - 15 - 10a + 15 = \underline{\underline{9b - 10a}}$$

$$04) 1. -(2g - 7h) = -2g + 7h = \underline{\underline{7h - 2g}} \quad \textcircled{D}$$
$$2. -(7h - \frac{1}{2}g) = -7h + \frac{1}{2}g = \underline{\underline{\frac{g}{2} - 7h}} \quad \textcircled{E}$$
$$3. -(\frac{g}{4} - 2h) = 2h - \frac{g}{4} = \underline{\underline{2h - \frac{1}{4}g}} \quad \textcircled{A}$$

$\frac{1}{2}g = \frac{g}{2}$

$$05) 1,5y - \frac{5}{6}y + \frac{y}{3} = \frac{3}{2}y - \frac{5}{6}y + \frac{y}{3} = \frac{9y - 5y + 2y}{6} = \frac{6y}{6} = \underline{\underline{y}}$$

$$06) 0,5 - u \cdot (3 - \frac{5u}{2}) = 0,5 - 2 \cdot (3 - \frac{5 \cdot 2}{2}) = 0,5 - 2 \cdot (3 - 5) =$$

PRVOČÍSLO = číslo dělitelné č. 1 a samo sebou $= 0,5 - 2 \cdot (-2) =$
 $= 0,5 + 4 = \underline{\underline{4,5}}$

$$07) \frac{x^2 - y}{2 \cdot (x + y)} = \frac{4 + 8}{2 \cdot (2 - 8)} = \frac{12}{-12} = \underline{\underline{-1}} \quad \textcircled{A}$$

$$08) 2a^2b \cdot ? = -16a^6b^3$$

$-8a^4b^2$

$$\frac{-16a^6b^3}{2a^2b} = \underline{\underline{-8a^4b^2}}$$

$$09) 1. 8x^3y - 12x^2y^3 = \underline{\underline{4x^2y \cdot (2x - 3y^2)}}$$

$$2. \frac{1}{4}ab^2 - 2ab = \underline{\underline{\frac{ab}{2} \cdot (\frac{1}{2}b - 4)}}$$

$$10) (2u - v)^2 = 4u^2 - 4uv + v^2 \quad \textcircled{C}$$

$$(A - B)^2 = A^2 - 2 \cdot A \cdot B + B^2$$

$$11) v \cdot (v^2 - 4s) - (v - 2s)^2 =$$

$$v^3 - 4vs - (v^2 - 4vs + 4s^2) = v^3 - 4vs - v^2 + 4vs - 4s^2 = \underline{\underline{v^3 - v^2 - 4s^2}}$$

$$12) (3a - 4b)^2 - (6b - 2a)^2 =$$

$$= \underline{9a^2} - \underline{24ab} + \underline{16b^2} - \underline{36b^2} + \underline{24ab} - \underline{4a^2} = \underline{\underline{5a^2 - 20b^2}}$$

$$13) 1. (6p - 8q)^2 - 4 \cdot (3p - 4q) \cdot (3p + 4q) =$$

$$(A - B) \cdot (A + B) = A^2 - B^2$$

$$= 36p^2 - 96pq + 64q^2 - 4 \cdot (9p^2 - 16q^2) =$$

$$= \underline{36p^2} - \underline{96pq} + \underline{64q^2} - \underline{36p^2} + \underline{64q^2} = \underline{\underline{128q^2 - 96pq}}$$

$$2. (4p - 8q)^2 - 8 \cdot \frac{(2p - 4q)}{2 \cdot (p - 2q)} \cdot (p - 2q) =$$

$$= 16p^2 - 64pq + 64q^2 - 16 \cdot (p - 2q)^2 =$$

$$= 16p^2 - 64pq + 64q^2 - 16 \cdot (p^2 - 4pq + 4q^2) =$$

$$= \underline{16p^2} - \underline{64pq} + \underline{64q^2} - \underline{16p^2} + \underline{64pq} - \underline{64q^2} = \underline{\underline{0}}$$

$$14) 1. 4n^2 - 9s^2 \quad \textcircled{A} \quad A^2 - B^2 = (A - B) \cdot (A + B)$$

$$2. 4n^2 - 36s^2 \quad \textcircled{B}$$

$$3. 4n^2 - 12ns + 9s^2 \quad \textcircled{E} \quad A^2 - 2AB + B^2 = (A - B)^2$$

$$15) - \left(\frac{3v^2}{2} + 2uv \right) + \frac{1}{2} \cdot (v + 2u)^2 =$$

$$= -\frac{3v^2}{2} - 2uv + \frac{1}{2} (v^2 + 4uv + 4u^2) =$$

$$= \underline{-\frac{3v^2}{2}} - 2uv + \underline{\frac{v^2}{2}} + \underline{2uv} + 2u^2 = \underline{\underline{-v^2 + 2u^2}}$$

$$16) \quad 1. \quad \left(\frac{x}{2} + 3y\right)^2 = \frac{x^2}{4} + 3xy + 9y^2$$

$A^2 + 2 \cdot A \cdot B + B^2$

$$2. \quad \left(\frac{5}{2} - 3xy\right)^2 = \frac{25}{4} - 15xy + 9x^2y^2$$

$$17) \quad 9x^2 - 36u^2 = 9 \cdot (x^2 - 4u^2) = 9 \cdot (x - 2u) \cdot (x + 2u)$$

$A^2 - B^2 \qquad (A - B) \cdot (A + B)$

$$18) \quad 2 \cdot \frac{m}{3} - 1 = 0 \quad | +1$$

$$\frac{2m}{3} = 0 + 1$$

$$\frac{2m}{3} = 1 \quad | : \frac{2}{3} = \cdot \frac{3}{2}$$

$$m = 1 \cdot \frac{3}{2}$$

$$\underline{\underline{m = \frac{3}{2}}}$$

$$19) \quad \frac{1-2a}{3-a} = 0, \text{ když } 1-2a=0 \quad a \neq 3$$

$$\downarrow$$

$$-2a = -1$$

$$\underline{\underline{a = \frac{1}{2}}} \quad (E) \quad \boxed{a \neq 3}$$

$$20) \quad 5 \text{ krabiček}$$

$$5 \cdot (a \cdot b) = 5ab \quad (E)$$

$$21) \quad \begin{array}{l} \text{Tranzit} \dots \dots n \\ \text{Pick-up} \dots \dots \frac{n}{2} \end{array}$$

$$3 \text{ dny} \quad 4 \text{ tranzity} \quad 2 \text{ pick-upy}$$

$$3 \cdot (4n + 2 \cdot \frac{n}{2}) =$$

$$= 3 \cdot (4n + n) = 3 \cdot 5n = \underline{\underline{15n}}$$

$$22) \quad \begin{array}{l} k \rightarrow \text{prohry} \Rightarrow 0 \text{ bodů} \cdot k \\ (30-k) \rightarrow \text{výhry} \Rightarrow 3 \text{ body} \cdot (30-k) \end{array} \left. \vphantom{\begin{array}{l} k \\ (30-k) \end{array}} \right\} \text{ celkem bodů}$$

$$3 \cdot (30-k) + 0 \cdot k = \underline{\underline{90-3k}}$$

$$23) \quad (n - 7n) : n = -6n : n = \frac{-6n}{n} = \underline{\underline{-6}}$$

\uparrow \uparrow
 dvojč. 7. číslo

$$24) \quad \begin{array}{l} D \dots \text{dospělý pes} \\ \frac{D}{2} \dots \text{dospělá stěně} \\ \frac{1}{3} \cdot \frac{D}{4} \dots \text{3 měsíční stěně} \\ \frac{D}{4} \dots \text{půlroční stěně} \end{array} \quad \left. \begin{array}{l} \uparrow \\ \uparrow \\ \uparrow \end{array} \right\} \frac{D}{2} : \frac{D}{12} = \frac{D}{2} \cdot \frac{12}{D} = \underline{\underline{6}} \quad \textcircled{C}$$

25) minulý měsíc ... n vozů
 ... celkem k peněz
 cena 1 auta $x = \frac{k}{n}$
 tento měsíc cena $\frac{4}{5}x$ ($\sigma \frac{1}{5}$ méně)
 Chytí se vydat 4k

$$n \cdot x = k \quad \text{stejná množství} \Rightarrow \sigma \frac{1}{5} \text{ min}$$

$$\underline{\underline{5 \cdot n}} \Rightarrow \sigma \frac{1}{5} \text{ min} \text{ než } 5k, \text{ což je } 4k$$

$$26) \quad \underbrace{k \cdot n}_{\text{jednoduché úlohy}} + 6 \cdot \underbrace{\frac{kn}{3}}_{\text{body za jednoduché}} = k \cdot n + 2kn = \underline{\underline{3kn}} \quad \textcircled{D}$$

\uparrow
 body za obšířně