BLESKOVKY B

1/Hene

1. Bleskovka

a) $x^{12} - y^6 = (x^6 - y^3)(x^6 + y^3) = (x^2 - y)\cdot(x^4 + x^2y + y^2)\cdot(x^2 + y)\cdot(x^4 - x^2y + y^2)$

($A^2 - B^2$; $A^3 - B^3$; $A^3 + B^3$; $A - B$; $A^2 + AB + B^2$; $A + B$; $A^2 - AB + B^2$)

b) $5t - 2tm - 10m + 25 = t(5 - 2m) + 5(-2m + 5) = (5 - 2m)(t + 5)$

c) $x^3 - x^2 - 4x + 4 = x^2(x-1) - 4(x-1) = (x-1)(x^2-4) = (x-1)\cdot(x-2)(x+2)$

d) $16abx^2 + 40abxy + 25aby^2 = ab(16x^2 + 40xy + 25y^2) \dots ab(4x + 5y)^2$

e) $49x^4 - 4a^2 + 28a - 49 = 49x^4 - (2a - 7)^2 = (7x^2 - 2a + 7)(7x^2 + 2a - 7)$

(A^2; B^2)

2. Bleskovka

① a) $x^2 + 6x + 9 = (x+3)(x+3) = (x+3)^2$

b) $-2x^2 - 16x - 11 = -2(x^2 + 8x + 4^2) - 11 - (-2)\cdot 16 =$
$= -2(x+4)^2 - 11 - (-32) =$
$= -2(x+4)^2 - 11 + 32 = -2(x+4)^2 + 21$

c) $3x^2 + 15x - 5 = 3\left(x^2 + 5x + \left(\frac{5}{2}\right)^2\right) - 5 - \left(3\cdot\frac{25}{4}\right) =$
$= 3\left(x + \frac{5}{2}\right)^2 - \frac{5}{1} - \frac{75}{4} =$
$= 3\left(x + \frac{5}{2}\right)^2 - \frac{20 + 75}{4} = 3\left(x + \frac{5}{2}\right)^2 - \frac{95}{4}$

d) $-4x^2 - 12x + 1 = -4\left(x^2 + 3x + \left(\frac{3}{2}\right)^2\right) + 1 - (-4)\cdot\frac{9}{4} =$
$= -4\left(x + \frac{3}{2}\right)^2 + \frac{1}{1} + \frac{36}{4} = -4\left(x + \frac{3}{2}\right)^2 + \frac{40}{4} = -4\left(x + \frac{3}{2}\right)^2 + 10$

e) $5x^2 + 9x - 2 = 5\left(x^2 + \frac{9}{5}x + \left(\frac{9}{10}\right)^2\right) - 2 - \left(5\cdot\frac{81}{100}\right) =$
$= 5\left(x + \frac{9}{10}\right)^2 - 2 - \frac{405}{100} =$
$= 5\left(x + \frac{9}{10}\right)^2 - \frac{200 + 405}{100} = 5\left(x + \frac{9}{10}\right)^2 - \frac{605}{100} = 5\left(x + \frac{9}{10}\right)^2 - \frac{121}{20}$

② a) $x^2 - 15x + 54 = (x-9)(x-6)$
b) $x^2 - 7x + 12 = (x-4)(x-3)$
c) $x^2 - x - 12 = (x-4)(x+3)$
d) $x^2 - 11x + 28 = (x-4)(x-7)$
e) $x^2 - 4x - 5 = (x-5)(x+1)$

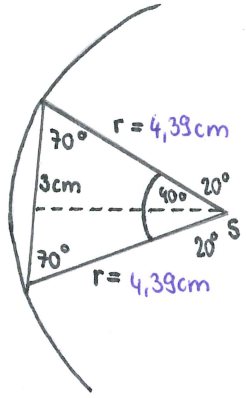
3. Bleskovka

①

a) $\sin 68°24' \doteq 0{,}930$ $\quad tg\ 28°32' \doteq 0{,}544$

b) $\cos\alpha = 0{,}35$ $\quad \alpha \doteq 69°31'$ $\quad cotg\ \beta = 1{,}35$ $\quad \beta \doteq 36°32'$

② a) VÝPOČET POLOMĚRU KRUŽNICE OPSANÉ



$360° : 9 = 40°$

$\sin 20° = \frac{1{,}5}{P}$ r

$\sin 20° \cdot P = 1{,}5$

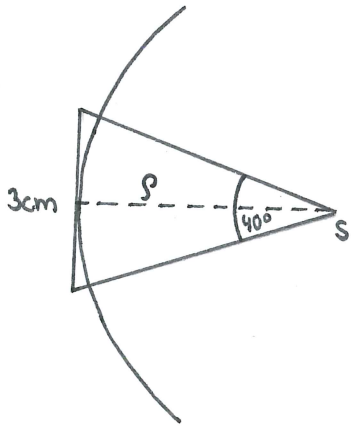
$r = P = \frac{1{,}5}{\sin 20°}$

(PŘEPONA) R = 4,39cm

$r_o = \frac{a}{2 \cdot \sin\left(\frac{180}{n}\right)}$ → počet stran

Poloměr kružnice opsané je 4,39cm.

b) VÝPOČET POLOMĚRU KRUŽNICE VEPSANÉ



$tg20° = \frac{1{,}5}{\rho}$

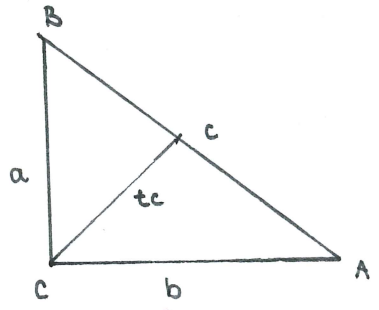
$\rho \cdot tg20° = 1{,}5$

$\rho = \frac{1{,}5}{tg20°} = 4{,}12cm$

$r_v = \frac{a}{2 \cdot tg\left(\frac{180}{n}\right)}$

Poloměr kružnice vepsané je 4,12cm.

③



$t_c = 3{,}5cm$

$\alpha = 24°$

$\beta = 90° - 24° = 66°$

$\sin 24° = \frac{a}{c}$

$7 \cdot \sin 24° = a$

$2{,}85cm \doteq a$

$c = 2 \cdot t_c$

$c = 2 \cdot 3{,}5 = 7cm$

$c^2 = a^2 + b^2$

$7^2 = 2{,}85^2 + b^2$

$49 = 8{,}11 + b^2$

$40{,}89 = b^2$

$6{,}39cm \doteq b$

Délky stran jsou: $a \doteq 2{,}85cm$

$b \doteq 6{,}39cm$

$c = 7cm$

4. Blesková

①

$$\left(\frac{b}{b-1}+1\right):\left(1-\frac{3b^2}{1-b^2}\right)=\left(\frac{b+1(b-1)}{b-1}\right):\left(\frac{1(1-b^2)-3b^2}{1-b^2}\right)=\left(\frac{b+b-1}{b-1}\right):\left(\frac{1-b^2-3b^2}{1-b^2}\right)=$$

$$=\left(\frac{2b-1}{b-1}\right):\left(\frac{1-4b^2}{(1-b)(1+b)}\right)=\left(\frac{\overset{(-1)(-2b+1)}{2b-1}}{\underset{(-1)(-b+1)}{b-1}}\right)\cdot\left(\frac{(1-b)(1+b)}{(1-2b)(1+2b)}\right)=\frac{1+b}{1+2b}$$

PODMÍNKY: $b-1\neq 0$ $\quad 1-b^2\neq 0$ $\quad (1-2b)(1+2b)\neq 0$

$b\neq 1$ $\quad (1-b)(1+b)\neq 0$ $\quad b\neq\pm\frac{1}{2}$

$b\neq\pm 1$

② $\frac{1}{R_1}+\frac{1}{R_2}=\frac{1}{R}$

a) (VYTÝKÁNÍ R)

$\frac{1}{R_1}+\frac{1}{R_2}=\frac{1}{R}\quad /\cdot R$

$R\left(\frac{1}{R_1}+\frac{1}{R_2}\right)=1$

$\frac{R}{R_1}+\frac{R}{R_2}=1$

$\frac{RR_2+RR_1}{R_1R_2}=1$

$R(R_2+R_1)=R_1R_2$

$R=\frac{R_1R_2}{R_2+R_1}$

b) (VYTÝKÁNÍ R_1)

$\frac{1}{R_1}+\frac{1}{R_2}=\frac{1}{R}\quad /(-\frac{1}{R_2})$

$\frac{1}{R_1}=\frac{1}{R}-\frac{1}{R_2}$

$1=R_1\left(\frac{1}{R}-\frac{1}{R_2}\right)$

$1=\frac{R_1}{R}-\frac{R_1}{R_2}$

$1=\frac{R_1R_2-R_1R}{RR_2}$

$RR_2=R_1(R_2-R)$

$\frac{RR_2}{R_2-R}=R_1$

5. Blesková

① $1{,}6(x-3) - 2(3+0{,}2x) + 4{,}8 = 0$

$1{,}6x - 4{,}8 - 6 - 0{,}4x + 4{,}8 = 0$

$1{,}2x - 6 = 0$

$x = 5$

$\mathcal{K} = \{5\}$

Zk: $L(5): 1{,}6(5-3) - 2(3+0{,}2\cdot 5) + 4{,}8 =$

$= 3{,}2 - 6 - 2 + 4{,}8 = 0$

$P(5): = 0$

$L = P$

② $\frac{6-t}{4} - 3 = \frac{2t+6}{7} - \frac{t+4}{2} \quad / \cdot 28$

$7(6-t) - 3\cdot 28 = 4\cdot(2t+6) - 14(t+4)$

$42 - 7t - 84 = 8t + 24 - 14t - 56$

$-7t - 42 = -6t - 32$

$-t = 10$

$t = -10$

$\mathcal{K} = \{-10\}$

Zk: $L(-10): \frac{6+10}{4} - 3 = 1$

$P(-10): \frac{2\cdot(-10)+6}{7} - \frac{(-10)+4}{2} = \frac{-20+6}{7} + \frac{6}{2} =$

$= -\frac{14}{7} + \frac{6}{2} = \frac{-28+42}{14} = \frac{14}{14} = 1$

$L = P$