

Úlohy

1 Vektory

1.1 Zapište vektor \vec{w} jako lineární kombinaci vektorů \vec{u} a \vec{v}

1. $\vec{w} = (-6, 4)$, $\vec{u} = (2, -2)$, $\vec{v} = (-2, 4)$
2. $\vec{w} = (31, 11)$, $\vec{u} = (-5, -1)$, $\vec{v} = (-4, -2)$
3. $\vec{w} = (-13, 10)$, $\vec{u} = (-4, 5)$, $\vec{v} = (-1, 0)$
4. $\vec{w} = (-15, 1)$, $\vec{u} = (-3, 0)$, $\vec{v} = (3, -1)$
5. $\vec{w} = (3, 20)$, $\vec{u} = (1, 5)$, $\vec{v} = (-2, -5)$
6. $\vec{w} = (0, -16)$, $\vec{u} = (1, 4)$, $\vec{v} = (-1, 0)$
7. $\vec{w} = (0, 25)$, $\vec{u} = (-5, -2)$, $\vec{v} = (0, -5)$
8. $\vec{w} = (12, 8)$, $\vec{u} = (3, -3)$, $\vec{v} = (-3, -1)$
9. $\vec{w} = (1, 19)$, $\vec{u} = (-4, -4)$, $\vec{v} = (-5, 1)$
10. $\vec{w} = (10, 8)$, $\vec{u} = (-4, -5)$, $\vec{v} = (-1, 1)$

1.2 Vypočítejte velikost vektoru \vec{u}

1. $\vec{u} = (5, 3)$
2. $\vec{u} = (1, -4)$
3. $\vec{u} = (-3, 3)$
4. $\vec{u} = (0, -4)$
5. $\vec{u} = (-3, 5)$
6. $\vec{u} = (-5, -3)$
7. $\vec{u} = (-2, 4)$
8. $\vec{u} = (3, 2)$
9. $\vec{u} = (-2, 3)$
10. $\vec{u} = (3, 4)$

1.3 Vypočítejte velikost vektoru \vec{u}

1. $\vec{u} = (-3, 3, -2)$
2. $\vec{u} = (-3, 4, -3)$
3. $\vec{u} = (4, -2, 3)$
4. $\vec{u} = (-4, 5, 3)$
5. $\vec{u} = (-5, 5, -2)$

6. $\vec{u} = (5, -5, 1)$
7. $\vec{u} = (3, -5, -5)$
8. $\vec{u} = (4, 4, -3)$
9. $\vec{u} = (3, -2, -2)$
10. $\vec{u} = (-4, -1, 3)$

1.4 Nalezněte úhel mezi vektory \vec{u} a \vec{v} .

1. $\vec{u} = \left(\frac{3\sqrt{2}}{2}, \frac{3\sqrt{2}}{2}\right)$, $\vec{v} = \left(\frac{3\sqrt{2}}{4} + \frac{3\sqrt{6}}{4}, -\frac{3\sqrt{2}}{4} + \frac{3\sqrt{6}}{4}\right)$
2. $\vec{u} = (-2, -2\sqrt{3})$, $\vec{v} = (-\sqrt{6} - \sqrt{2}, -\sqrt{6} + \sqrt{2})$
3. $\vec{u} = \left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$, $\vec{v} = \left(\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}, -\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}\right)$
4. $\vec{u} = (-1, \sqrt{3})$, $\vec{v} = \left(\frac{\sqrt{2}}{2} + \frac{\sqrt{6}}{2}, -\frac{\sqrt{6}}{2} + \frac{\sqrt{2}}{2}\right)$
5. $\vec{u} = (4, 0)$, $\vec{v} = (-2, -2\sqrt{3})$
6. $\vec{u} = (-2, 0)$, $\vec{v} = (\sqrt{2}, \sqrt{2})$
7. $\vec{u} = (-1, \sqrt{3})$, $\vec{v} = (1, \sqrt{3})$
8. $\vec{u} = \left(-\frac{3}{2}, \frac{3\sqrt{3}}{2}\right)$, $\vec{v} = \left(\frac{3}{2}, -\frac{3\sqrt{3}}{2}\right)$
9. $\vec{u} = \left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$, $\vec{v} = \left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$
10. $\vec{u} = \left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$, $\vec{v} = (0, -1)$

2 Přímka a její rovnice

2.1 Zapište všechny tvary rovnice přímky p dané body A a B .

1. $A = [5, -5]$, $B = [0, 0]$
2. $A = [3, 1]$, $B = [3, -4]$
3. $A = [2, -3]$, $B = [0, -3]$
4. $A = [2, -2]$, $B = [2, 5]$
5. $A = [-1, -5]$, $B = [4, 0]$
6. $A = [4, -5]$, $B = [-3, 1]$
7. $A = [5, -3]$, $B = [0, 5]$
8. $A = [5, 5]$, $B = [1, 3]$
9. $A = [2, -1]$, $B = [4, -2]$
10. $A = [-4, 5]$, $B = [4, 4]$

2.2 Zapište všechny tvary rovnice přímky p dané bodem A a směrovým vektorem \vec{u} .

1. $A = [5, 4], \vec{u} = (3, 1)$
2. $A = [4, 3], \vec{u} = (1, -5)$
3. $A = [3, 3], \vec{u} = (-2, 2)$
4. $A = [-5, 5], \vec{u} = (4, 1)$
5. $A = [3, -3], \vec{u} = (2, -3)$
6. $A = [-2, -2], \vec{u} = (5, -1)$
7. $A = [1, 4], \vec{u} = (3, 0)$
8. $A = [-4, -3], \vec{u} = (4, -5)$
9. $A = [-2, -3], \vec{u} = (3, -4)$
10. $A = [0, -1], \vec{u} = (-3, 2)$

2.3 Zapište všechny tvary rovnice přímky p , která je kolmá na přímkou q a prochází bodem A .

1. $q: 6x + 4y + 10 = 0, A = [3, 3]$
2. $q = \{[4 - 8t, 4]; t \in \mathbb{R}\}, A = [1, 0]$
3. $q = \{[-t - 2, 3 - t]; t \in \mathbb{R}\}, A = [-3, 4]$
4. $q: -8x + 4y + 28 = 0, A = [5, -1]$
5. $q = \{[3t - 4, 2t - 4]; t \in \mathbb{R}\}, A = [-2, 3]$
6. $q: x + 2y - 7 = 0, A = [-5, -2]$
7. $q: -6x + 5y + 5 = 0, A = [-1, 4]$
8. $q: -x - 5y + 20 = 0, A = [-5, 0]$
9. $q = \{[5t - 5, 2 - 7t]; t \in \mathbb{R}\}, A = [5, -5]$
10. $q: 6y - 6 = 0, A = [3, 5]$

2.4 Zapište všechny tvary rovnice přímky p , která s osou x svírá úhel ϕ a osu y protíná v bodě $[0, q]$.

1. $\phi = \frac{\pi}{2}, q = -4$
2. $\phi = \frac{5\pi}{6}, q = 2$
3. $\phi = \frac{2\pi}{3}, q = -4$
4. $\phi = \frac{2\pi}{3}, q = 5$
5. $\phi = \frac{5\pi}{6}, q = -4$
6. $\phi = \pi, q = -2$
7. $\phi = \frac{5\pi}{6}, q = -4$

8. $\phi = \frac{\pi}{3}, q = -1$
9. $\phi = \frac{\pi}{3}, q = -4$
10. $\phi = \pi, q = 0$

2.5 Vypočítejte odchylku přímek p a q

1. $p: 3x - 5y + 24 = 0, q = \{[-5t - 3, 3 - 3t]; t \in \mathbb{R}\}$
2. $p: -x + y - 5 = 0, q = \{[t(-\frac{1}{2} + \frac{\sqrt{3}}{2}) - 4, t(-\frac{\sqrt{3}}{2} - \frac{1}{2}) + 1]; t \in \mathbb{R}\}$
3. $p = \{[2t + 4, 4t]; t \in \mathbb{R}\}, q = \{[t(-2 - \sqrt{3}) + 4, t(1 - 2\sqrt{3})]; t \in \mathbb{R}\}$
4. $p: -4x = 0, q = \{[2\sqrt{3}t, 2t - 2]; t \in \mathbb{R}\}$
5. $p: -x + 3y - 7 = 0, q: x(-\frac{3}{2} + \frac{\sqrt{3}}{2}) + y(-\frac{3\sqrt{3}}{2} - \frac{1}{2}) - \frac{11}{2} + \frac{7\sqrt{3}}{2} = 0$
6. $p = \{[5t, 2 - 3t]; t \in \mathbb{R}\}, q: 5x - 3y + 6 = 0$
7. $p: -3x + 2y - 11 = 0, q = \{[\frac{\sqrt{2}t}{2} - 3, -\frac{5\sqrt{2}t}{2} + 1]; t \in \mathbb{R}\}$
8. $p = \{[-5t - 2, -5]; t \in \mathbb{R}\}, q = \{[\frac{5\sqrt{2}t}{2} - 2, -\frac{5\sqrt{2}t}{2} - 5]; t \in \mathbb{R}\}$
9. $p: -4x - 2y - 12 = 0, q: -\sqrt{2}x - 3\sqrt{2}y + 7\sqrt{2} = 0$
10. $p = \{[5t + 3, -2t - 2]; t \in \mathbb{R}\}, q: x(-1 + \frac{5\sqrt{3}}{2}) + y(-\frac{5}{2} - \sqrt{3}) - \frac{19\sqrt{3}}{2} - 2 = 0$

2.6 Zapište rovnici přímky p dané body A a B .

1. $A = [4, 5, -2], B = [4, 2, -1]$
2. $A = [5, 0, 2], B = [-5, -2, 3]$
3. $A = [3, -5, -3], B = [-1, -2, 5]$
4. $A = [-4, 2, -4], B = [-2, 3, 5]$
5. $A = [0, -1, -1], B = [3, 5, -2]$
6. $A = [0, 3, 2], B = [2, -3, -1]$
7. $A = [4, -5, -4], B = [3, 5, -3]$
8. $A = [-4, -3, 1], B = [-2, -2, 2]$
9. $A = [4, -5, -4], B = [0, -5, 5]$
10. $A = [2, 4, 5], B = [1, -4, -1]$

3 Rovina a její rovnice

3.1 Zapište všechny tvary rovnice roviny σ dané body A , B a C .

1. $A = [-2, 0, -5]$, $B = [-2, 5, -4]$, $C = [5, 5, -1]$
2. $A = [4, 4, 5]$, $B = [1, 2, 3]$, $C = [4, -1, 4]$
3. $A = [-2, 0, 1]$, $B = [4, 0, 3]$, $C = [2, -5, -4]$
4. $A = [-2, 5, 4]$, $B = [-5, 3, 0]$, $C = [-4, 3, -3]$
5. $A = [0, 2, 0]$, $B = [-3, 3, -3]$, $C = [-3, 3, -1]$
6. $A = [-5, -5, -2]$, $B = [-1, 0, -5]$, $C = [1, 5, -5]$
7. $A = [0, 1, -5]$, $B = [-2, -4, 3]$, $C = [4, 3, 0]$
8. $A = [-1, 2, 1]$, $B = [-2, -5, -3]$, $C = [3, 3, 1]$
9. $A = [1, 2, -3]$, $B = [2, 0, 2]$, $C = [-5, 4, -3]$
10. $A = [-3, -4, 3]$, $B = [0, 5, 2]$, $C = [-2, -2, -1]$

Odpovědi

1 Vektory

1.1 Zapište vektor \vec{w} jako lineární kombinaci vektorů \vec{u} a \vec{v}

1. $(-6, 4) = -4 \cdot (2, -2) - 1 \cdot (-2, 4)$
2. $(31, 11) = -3 \cdot (-5, -1) - 4 \cdot (-4, -2)$
3. $(-13, 10) = 2 \cdot (-4, 5) + 5 \cdot (-1, 0)$
4. $(-15, 1) = 4 \cdot (-3, 0) - 1 \cdot (3, -1)$
5. $(3, 20) = 5 \cdot (1, 5) + 1 \cdot (-2, -5)$
6. $(0, -16) = -4 \cdot (1, 4) - 4 \cdot (-1, 0)$
7. $(0, 25) = 0 \cdot (-5, -2) - 5 \cdot (0, -5)$
8. $(12, 8) = -1 \cdot (3, -3) - 5 \cdot (-3, -1)$
9. $(1, 19) = -4 \cdot (-4, -4) + 3 \cdot (-5, 1)$
10. $(10, 8) = -2 \cdot (-4, -5) - 2 \cdot (-1, 1)$

1.2 Vypočítejte velikost vektoru \vec{u}

1. $\sqrt{34}$
2. $\sqrt{17}$
3. $3\sqrt{2}$
4. 4
5. $\sqrt{34}$
6. $\sqrt{34}$
7. $2\sqrt{5}$
8. $\sqrt{13}$
9. $\sqrt{13}$
10. 5

1.3 Vypočítejte velikost vektoru \vec{u}

1. $\sqrt{22}$
2. $\sqrt{34}$
3. $\sqrt{29}$
4. $5\sqrt{2}$
5. $3\sqrt{6}$

6. $\sqrt{51}$
7. $\sqrt{59}$
8. $\sqrt{41}$
9. $\sqrt{17}$
10. $\sqrt{26}$

1.4 Nalezněte úhel mezi vektory \vec{u} a \vec{v} .

1. $\frac{\pi}{6}$
2. $\frac{\pi}{4}$
3. $\frac{3\pi}{4}$
4. $\frac{3\pi}{4}$
5. $\frac{2\pi}{3}$
6. $\frac{3\pi}{4}$
7. $\frac{\pi}{3}$
8. π
9. $\frac{\pi}{6}$
10. $\frac{\pi}{4}$

2 Přímka a její rovnice

2.1 Zapište všechny tvary rovnice přímky p dané body A a B.

1. $p = \{[5 - 5t, 5t - 5]; t \in \mathbb{R}\}$, $p: 5x + 5y = 0$, úsekový tvar neexistuje, $p: y = -x$
2. $p = \{[3, 1 - 5t]; t \in \mathbb{R}\}$, $p: 15 - 5x = 0$, $p: \frac{x}{3} = 1$, směrnicový tvar neexistuje
3. $p = \{[2 - 2t, -3]; t \in \mathbb{R}\}$, $p: 2y + 6 = 0$, $p: -\frac{y}{3} = 1$, $p: y = -3$
4. $p = \{[2, 7t - 2]; t \in \mathbb{R}\}$, $p: 7x - 14 = 0$, $p: \frac{x}{2} = 1$, směrnicový tvar neexistuje
5. $p = \{[5t - 1, 5t - 5]; t \in \mathbb{R}\}$, $p: 5x - 5y - 20 = 0$, $p: \frac{x}{4} - \frac{y}{4} = 1$, $p: y = x - 4$
6. $p = \{[4 - 7t, 6t - 5]; t \in \mathbb{R}\}$, $p: 6x + 7y + 11 = 0$, $p: -\frac{6x}{11} - \frac{7y}{11} = 1$, $p: y = -\frac{6x}{7} - \frac{11}{7}$
7. $p = \{[5 - 5t, 8t - 3]; t \in \mathbb{R}\}$, $p: 8x + 5y - 25 = 0$, $p: \frac{8x}{25} + \frac{y}{5} = 1$, $p: y = 5 - \frac{8x}{5}$
8. $p = \{[5 - 4t, 5 - 2t]; t \in \mathbb{R}\}$, $p: -2x + 4y - 10 = 0$, $p: -\frac{x}{5} + \frac{2y}{5} = 1$, $p: y = \frac{x}{2} + \frac{5}{2}$
9. $p = \{[2t + 2, -t - 1]; t \in \mathbb{R}\}$, $p: -x - 2y = 0$, úsekový tvar neexistuje, $p: y = -\frac{x}{2}$
10. $p = \{[8t - 4, 5 - t]; t \in \mathbb{R}\}$, $p: -x - 8y + 36 = 0$, $p: \frac{x}{36} + \frac{2y}{9} = 1$, $p: y = \frac{9}{2} - \frac{x}{8}$

2.2 Zapište všechny tvary rovnice přímky p dané bodem A a směrovým vektorem \vec{u} .

1. $p = \{[3t + 5, t + 4]; t \in \mathbb{R}\}$, $p: x - 3y + 7 = 0$, $p: -\frac{x}{7} + \frac{3y}{7} = 1$, $p: y = \frac{x}{3} + \frac{7}{3}$
2. $p = \{[t + 4, 3 - 5t]; t \in \mathbb{R}\}$, $p: -5x - y + 23 = 0$, $p: \frac{5x}{23} + \frac{y}{23} = 1$, $p: y = 23 - 5x$
3. $p = \{[3 - 2t, 2t + 3]; t \in \mathbb{R}\}$, $p: 2x + 2y - 12 = 0$, $p: \frac{x}{6} + \frac{y}{6} = 1$, $p: y = 6 - x$
4. $p = \{[4t - 5, t + 5]; t \in \mathbb{R}\}$, $p: x - 4y + 25 = 0$, $p: -\frac{x}{25} + \frac{4y}{25} = 1$, $p: y = \frac{x}{4} + \frac{25}{4}$
5. $p = \{[2t + 3, -3t - 3]; t \in \mathbb{R}\}$, $p: -3x - 2y + 3 = 0$, $p: x + \frac{2y}{3} = 1$, $p: y = \frac{3}{2} - \frac{3x}{2}$
6. $p = \{[5t - 2, -t - 2]; t \in \mathbb{R}\}$, $p: -x - 5y - 12 = 0$, $p: -\frac{x}{12} - \frac{5y}{12} = 1$, $p: y = -\frac{x}{5} - \frac{12}{5}$
7. $p = \{[3t + 1, 4]; t \in \mathbb{R}\}$, $p: 12 - 3y = 0$, $p: \frac{y}{4} = 1$, $p: y = 4$
8. $p = \{[4t - 4, -5t - 3]; t \in \mathbb{R}\}$, $p: -5x - 4y - 32 = 0$, $p: -\frac{5x}{32} - \frac{y}{8} = 1$, $p: y = -\frac{5x}{4} - 8$
9. $p = \{[3t - 2, -4t - 3]; t \in \mathbb{R}\}$, $p: -4x - 3y - 17 = 0$, $p: -\frac{4x}{17} - \frac{3y}{17} = 1$, $p: y = -\frac{4x}{3} - \frac{17}{3}$
10. $p = \{[-3t, 2t - 1]; t \in \mathbb{R}\}$, $p: 2x + 3y + 3 = 0$, $p: -\frac{2x}{3} - y = 1$, $p: y = -\frac{2x}{3} - 1$

2.3 Zapište všechny tvary rovnice přímky p, která je kolmá na přímkou q a prochází bodem A.

1. $p = \{[6t + 3, 4t + 3]; t \in \mathbb{R}\}$, $p: 4x - 6y + 6 = 0$, $p: -\frac{2x}{3} + y = 1$, $p: y = \frac{2x}{3} + 1$
2. $p = \{[1, 8t]; t \in \mathbb{R}\}$, $p: 8x - 8 = 0$, $p: x = 1$, směrníkový tvar neexistuje
3. $p = \{[-t - 3, t + 4]; t \in \mathbb{R}\}$, $p: x + y - 1 = 0$, $p: x + y = 1$, $p: y = 1 - x$
4. $p = \{[5 - 8t, 4t - 1]; t \in \mathbb{R}\}$, $p: 4x + 8y - 12 = 0$, $p: \frac{x}{3} + \frac{2y}{3} = 1$, $p: y = \frac{3}{2} - \frac{x}{2}$
5. $p = \{[2t - 2, 3 - 3t]; t \in \mathbb{R}\}$, $p: -3x - 2y = 0$, úsekový tvar neexistuje, $p: y = -\frac{3x}{2}$
6. $p = \{[t - 5, 2t - 2]; t \in \mathbb{R}\}$, $p: 2x - y + 8 = 0$, $p: -\frac{x}{4} + \frac{y}{8} = 1$, $p: y = 2x + 8$
7. $p = \{[-6t - 1, 5t + 4]; t \in \mathbb{R}\}$, $p: 5x + 6y - 19 = 0$, $p: \frac{5x}{19} + \frac{6y}{19} = 1$, $p: y = \frac{19}{6} - \frac{5x}{6}$
8. $p = \{[-t - 5, -5t]; t \in \mathbb{R}\}$, $p: -5x + y - 25 = 0$, $p: -\frac{x}{5} + \frac{y}{25} = 1$, $p: y = 5x + 25$
9. $p = \{[5 - 7t, -5t - 5]; t \in \mathbb{R}\}$, $p: -5x + 7y + 60 = 0$, $p: \frac{x}{12} - \frac{7y}{60} = 1$, $p: y = \frac{5x}{7} - \frac{60}{7}$
10. $p = \{[3, 6t + 5]; t \in \mathbb{R}\}$, $p: 6x - 18 = 0$, $p: \frac{x}{3} = 1$, směrníkový tvar neexistuje

2.4 Zapište všechny tvary rovnice přímky p, která s osou x svírá úhel ϕ a osu y protíná v bodě $[0, q]$.

1. $p = \{[t, \tilde{\infty}t - 4]; t \in \mathbb{R}\}$, $p: \tilde{\infty}x - y - 4 = 0$, $p: \tilde{\infty}x - \frac{y}{4} = 1$, $p: y = \tilde{\infty}x - 4$
2. $p = \{[t, -\frac{\sqrt{3}t}{3} + 2]; t \in \mathbb{R}\}$, $p: -\frac{\sqrt{3}x}{3} - y + 2 = 0$, $p: \frac{\sqrt{3}x}{6} + \frac{y}{2} = 1$, $p: y = -\frac{\sqrt{3}x}{3} + 2$
3. $p = \{[t, -\sqrt{3}t - 4]; t \in \mathbb{R}\}$, $p: -\sqrt{3}x - y - 4 = 0$, $p: -\frac{\sqrt{3}x}{4} - \frac{y}{4} = 1$, $p: y = -\sqrt{3}x - 4$
4. $p = \{[t, -\sqrt{3}t + 5]; t \in \mathbb{R}\}$, $p: -\sqrt{3}x - y + 5 = 0$, $p: \frac{\sqrt{3}x}{5} + \frac{y}{5} = 1$, $p: y = -\sqrt{3}x + 5$
5. $p = \{[t, -\frac{\sqrt{3}t}{3} - 4]; t \in \mathbb{R}\}$, $p: -\frac{\sqrt{3}x}{3} - y - 4 = 0$, $p: -\frac{\sqrt{3}x}{12} - \frac{y}{4} = 1$, $p: y = -\frac{\sqrt{3}x}{3} - 4$
6. $p = \{[t, -2]; t \in \mathbb{R}\}$, $p: -y - 2 = 0$, $p: -\frac{y}{2} = 1$, $p: y = -2$

7. $p = \{[t, -\frac{\sqrt{3}t}{3} - 4]; t \in \mathbb{R}\}$, $p : -\frac{\sqrt{3}x}{3} - y - 4 = 0$, $p : -\frac{\sqrt{3}x}{12} - \frac{y}{4} = 1$, $p : y = -\frac{\sqrt{3}x}{3} - 4$
8. $p = \{[t, \sqrt{3}t - 1]; t \in \mathbb{R}\}$, $p : \sqrt{3}x - y - 1 = 0$, $p : \sqrt{3}x - y = 1$, $p : y = \sqrt{3}x - 1$
9. $p = \{[t, \sqrt{3}t - 4]; t \in \mathbb{R}\}$, $p : \sqrt{3}x - y - 4 = 0$, $p : \frac{\sqrt{3}x}{4} - \frac{y}{4} = 1$, $p : y = \sqrt{3}x - 4$
10. $p = \{[t, 0]; t \in \mathbb{R}\}$, $p : -y = 0$, úsekový tvar neexistuje, $p : y = 0$

2.5 Vypočítejte odchylku přímek p a q

1. $\phi = 0$
2. $\phi = \frac{\pi}{3}$
3. $\phi = \frac{\pi}{6}$
4. $\phi = \frac{\pi}{3}$
5. $\phi = \frac{\pi}{6}$
6. $\phi = \frac{\pi}{2}$
7. $\phi = \frac{\pi}{4}$
8. $\phi = \frac{\pi}{4}$
9. $\phi = \frac{\pi}{4}$
10. $\phi = \frac{\pi}{3}$

2.6 Zapište rovnici přímky p dané body A a B .

1. $p = \{[4, 5 - 3t, t - 2]; t \in \mathbb{R}\}$
2. $p = \{[5 - 10t, -2t, t + 2]; t \in \mathbb{R}\}$
3. $p = \{[3 - 4t, 3t - 5, 8t - 3]; t \in \mathbb{R}\}$
4. $p = \{[2t - 4, t + 2, 9t - 4]; t \in \mathbb{R}\}$
5. $p = \{[3t, 6t - 1, -t - 1]; t \in \mathbb{R}\}$
6. $p = \{[2t, 3 - 6t, 2 - 3t]; t \in \mathbb{R}\}$
7. $p = \{[4 - t, 10t - 5, t - 4]; t \in \mathbb{R}\}$
8. $p = \{[2t - 4, t - 3, t + 1]; t \in \mathbb{R}\}$
9. $p = \{[4 - 4t, -5, 9t - 4]; t \in \mathbb{R}\}$
10. $p = \{[2 - t, 4 - 8t, 5 - 6t]; t \in \mathbb{R}\}$

3 Rovina a její rovnice

3.1 Zapište všechny tvary rovnice roviny σ dané body A , B a C .

1. $\sigma = \{[7s - 2, 5s + 5t, 4s + t - 5]; s, t \in \mathbb{R}\}$, $\sigma : 15x + 7y - 35z - 145 = 0$
2. $\sigma = \{[4 - 3t, -5s - 2t + 4, -s - 2t + 5]; s, t \in \mathbb{R}\}$, $\sigma : -8x - 3y + 15z - 31 = 0$
3. $\sigma = \{[4s + 6t - 2, -5s, -5s + 2t + 1]; s, t \in \mathbb{R}\}$, $\sigma : 10x + 38y - 30z + 50 = 0$
4. $\sigma = \{[-2s - 3t - 2, -2s - 2t + 5, -7s - 4t + 4]; s, t \in \mathbb{R}\}$, $\sigma : 6x - 13y + 2z + 69 = 0$
5. $\sigma = \{[-3s - 3t, s + t + 2, -s - 3t]; s, t \in \mathbb{R}\}$, $\sigma : 2x + 6y - 12 = 0$
6. $\sigma = \{[6s + 4t - 5, 10s + 5t - 5, -3s - 3t - 2]; s, t \in \mathbb{R}\}$, $\sigma : 15x - 6y + 10z + 65 = 0$
7. $\sigma = \{[4s - 2t, 2s - 5t + 1, 5s + 8t - 5]; s, t \in \mathbb{R}\}$, $\sigma : -41x + 42y + 16z + 38 = 0$
8. $\sigma = \{[4s - t - 1, s - 7t + 2, 1 - 4t]; s, t \in \mathbb{R}\}$, $\sigma : 4x - 16y + 27z + 9 = 0$
9. $\sigma = \{[-6s + t + 1, 2s - 2t + 2, 5t - 3]; s, t \in \mathbb{R}\}$, $\sigma : -10x - 30y - 10z + 40 = 0$
10. $\sigma = \{[s + 3t - 3, 2s + 9t - 4, -4s - t + 3]; s, t \in \mathbb{R}\}$, $\sigma : -34x + 11y - 3z - 49 = 0$