|  |  |
| --- | --- |
| Číslo projektu  | **CZ.1.07/1.5.00/34.0891**  |
| Číslo materiálu  | VYS\_42\_INOVACE\_08\_Planimetrie - vzájemná poloha přímky a kružnice  |
| Název školy  | Vyšší odborná škola, Střední průmyslová škola a Střední odborná škola řemesel a služeb, Strakonice, Zvolenská 934  |
| Autor  | RNDr. Eva Štěpánková  |
| Tematický celek  | MATEMATIKA  |
| Ročník  | 2. ročník  |
| Datum tvorby  | 3.4.2013 |

|  |  |
| --- | --- |
| Anotace  | Metodický pokyn  |
| *Materiál je určen pro žáky tříletých učebních oborů.**Pracovní list zahrnuje čtyři úlohy na procvičení vzájemné polohy přímky a kružnice (tečna, sečna, nesečna, tětiva).*  | *V pracovním listu jsou zahrnuty čtyři konstruktivní úlohy na procvičení pojmů tečna, sečna, nesečna, tětiva.**Žáci mohou řešit úlohy společně nebo je možné použít jednotlivé úlohy jako test.* |

**Pracovní list A**

**Úloha 1.**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [1;1], r = 2 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [-4;3], B = [2;3].

Přímka ***q*** je určena body C = [3;-4], D = [6;0].

Přímka ***r*** je určena body E = [1;-1], F = [2;2].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

**Pracovní list B**

**Úloha 2.**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [3;3], r = 2 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [-3;0], B = [0;5].

Přímka ***q*** je určena body C = [1;1], D = [1;3].

Přímka ***r*** je určena body E = [0;0], F = [3;4].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

**Pracovní list C**

**Úloha 3.**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [2;-2], r = 3 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [-4;1], B = [1;1].

Přímka ***q*** je určena body C = [2;4], D = [6;1].

Přímka ***r*** je určena body E = [-2;-2], F = [3;0].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

**Pracovní list D**

**Úloha 4.**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [1;-2], r = 3 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [4;-3], B = [4;0].

Přímka ***q*** je určena body C = [-5;1], D = [1;3].

Přímka ***r*** je určena body E = [-3;-3], F = [3;1].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

**Pracovní list A - řešení**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [1;1], r = 2 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [-4;3], B = [2;3].

Přímka ***q*** je určena body C = [3;-4], D = [6;0].

Přímka ***r*** je určena body E = [1;-1], F = [2;2].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  r |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  | p |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  q |
|  |  |  |  |  |  |  |  | 1 | S |  |  |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

p …..tečna q…..nesečna r…..sečna

**Pracovní list B - řešení**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [3;3], r = 2 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [-3;0], B = [0;5].

Přímka ***q*** je určena body C = [1;1], D = [1;3].

Přímka ***r*** je určena body E = [0;0], F = [3;4].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 | r |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  | k |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  | S |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  p |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  r |  | -2 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

p…nesečna q…tečna r…sečna

**Pracovní list C - řešení**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [2;-2], r = 3 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [-4;1], B = [1;1].

Přímka ***q*** je určena body C = [2;4], D = [6;1].

Přímka ***r*** je určena body E = [-2;-2], F = [3;0].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  q |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  |  |  |  |
|  |  |  | p |  |  |  |  | 1 |  |  |  |  |  |   |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  r |  |  |  | -2 |  | S |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  | k |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

p…..tečna q….nesečna r….sečna

**Pracovní list D - řešení**

V soustavě souřadnic narýsujte kružnici ***k(S;r***), S = [1;-2], r = 3 cm, a přímky ***p,q.r*.**

Přímka ***p*** je určena body A = [4;-3], B = [4;0].

Přímka ***q*** je určena body C = [-5;1], D = [1;3].

Přímka ***r*** je určena body E = [-3;-3], F = [3;1].

***Určete vzájemnou polohu přímek p, q, r a kružnice k.***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | ***y*** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 4 |  | q |  | p |  |  |  |
|  |  |  |  |  |  |  |  | 3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 2 |  |  |  |  r |  |  |  |
|  |  |  |  |  |  |  |  | 1 |  |  | k |  |  |  |  |
|  | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 ***x*** |
|  |  |  |  |  |  |  |  | -1 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -2 | S |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -3 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -4 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -6 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | -7 |  |  |  |  |  |  |  |

p….tečna q….nesečna r….sečna

Zdroj: Archív autora