

## Koordináta-geometria – alapozó feladatok

1. Határozd meg az  $AB$  szakasz felezőpontját!

- |                         |   |                         |   |
|-------------------------|---|-------------------------|---|
| a) $A(2; 3), B(1; 4)$   | <input type="text" value="(1,5 ; 2,5)"/>  | b) $A(5; 1), B(-4; 3)$  | <input type="text" value="(0,5 ; 2)"/>    |
| c) $A(2; 7), B(11; 10)$ | <input type="text" value="(1,5 ; 8,5)"/>  | d) $A(4; -3), B(5; 7)$  | <input type="text" value="(4,5 ; 2)"/>    |
| e) $A(-4; 4), B(5; -7)$ | <input type="text" value="(0,5 ; -1,5)"/> | f) $A(-4; -4), B(4; 4)$ | <input type="text" value="(0 ; 0)"/>      |
| g) $A(3; 7), B(-3; 10)$ | <input type="text" value="(0 ; 8,5)"/>    | h) $A(-1; -2), B(3; 4)$ | <input type="text" value="(1 ; 1)"/>      |
| i) $A(-1; 3), B(-2; 1)$ | <input type="text" value="(1,5 ; 2)"/>    | j) $A(4; -2), B(3; -4)$ | <input type="text" value="(3,5 ; -3)"/>   |
| k) $A(3; 7), B(-3; -1)$ | <input type="text" value="(0 ; 3)"/>      | l) $A(2; -3), B(-4; 0)$ | <input type="text" value="(1,5 ; -1,5)"/> |

2. Határozd meg a  $B$  pontot, ha tudjuk, hogy az  $AB$  szakasz felezőpontja  $F$ !

- |                         |  |                         |  |
|-------------------------|--|-------------------------|--|
| a) $A(2; 3), F(1; 4)$   | <input type="text" value="(0 ; 5)"/>   | b) $A(5; 1), F(-4; 3)$  | <input type="text" value="(14 ; -1)"/> |
| c) $A(2; 7), F(11; 10)$ | <input type="text" value="(20 ; 17)"/> | d) $A(4; -3), F(5; 7)$  | <input type="text" value="(6 ; 17)"/>  |
| e) $A(-4; 4), F(5; -7)$ | <input type="text" value="(14 ; -8)"/> | f) $A(-4; -4), F(4; 4)$ | <input type="text" value="(0 ; 0)"/>   |
| g) $A(3; 7), F(-3; 10)$ | <input type="text" value="(9 ; 13)"/>  | h) $A(-1; -2), F(3; 4)$ | <input type="text" value="(7 ; 1)"/>   |
| i) $A(-1; 3), F(-2; 1)$ | <input type="text" value="(1 ; 5)"/>   | j) $A(4; -2), F(3; -4)$ | <input type="text" value="(2 ; -6)"/>  |
| k) $A(3; 7), F(-3; -1)$ | <input type="text" value="(6 ; 3)"/>   | l) $A(2; -3), F(-4; 0)$ | <input type="text" value="(1 ; -3)"/>  |

3. Határozd meg az  $A$  és  $B$  pontok távolságát!

- |                         |                                    |                         |                                    |
|-------------------------|------------------------------------|-------------------------|------------------------------------|
| a) $A(2; 3), B(1; 4)$   | <input type="text" value="1,41"/>  | b) $A(5; 1), B(-4; 3)$  | <input type="text" value="7,22"/>  |
| c) $A(2; 7), B(11; 10)$ | <input type="text" value="8,48"/>  | d) $A(4; -3), B(5; 7)$  | <input type="text" value="10,01"/> |
| e) $A(-4; 4), B(5; -7)$ | <input type="text" value="11,21"/> | f) $A(-4; -4), B(4; 4)$ | <input type="text" value="11,31"/> |
| g) $A(3; 7), B(-3; 10)$ | <input type="text" value="6,70"/>  | h) $A(-1; -2), B(3; 4)$ | <input type="text" value="7,21"/>  |
| i) $A(-1; 3), B(-2; 1)$ | <input type="text" value="2,23"/>  | j) $A(4; -2), B(3; -4)$ | <input type="text" value="2,23"/>  |
| k) $A(3; 7), B(-3; -1)$ | <input type="text" value="10"/>    | l) $A(2; -3), B(-4; 0)$ | <input type="text" value="6,70"/>  |

4. Határozd meg az  $\vec{a}$  és  $\vec{b}$  vektor által bezárt szöget!

a)  $\vec{a}(2; 3), \vec{b}(1; 4)$

◦99'61

b)  $\vec{a}(5; 1), \vec{b}(-4; 3)$

◦18'181

c)  $\vec{a}(2; 7), \vec{b}(11; 10)$

◦82'18

d)  $\vec{a}(4; -3), \vec{b}(5; 7)$

◦88'16

e)  $\vec{a}(-4; 4), \vec{b}(5; -7)$

◦88'021

f)  $\vec{a}(-4; -4), \vec{b}(4; 4)$

◦081

g)  $\vec{a}(3; 7), \vec{b}(-3; 10)$

◦06'68

h)  $\vec{a}(-1; -2), \vec{b}(3; 4)$

◦02'691

i)  $\vec{a}(-1; 3), \vec{b}(-2; 1)$

◦45

j)  $\vec{a}(4; -2), \vec{b}(3; -4)$

◦95'92

k)  $\vec{a}(3; 7), \vec{b}(-3; -1)$

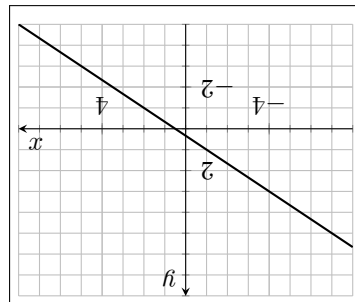
◦83'181

l)  $\vec{a}(2; -3), \vec{b}(-4; 0)$

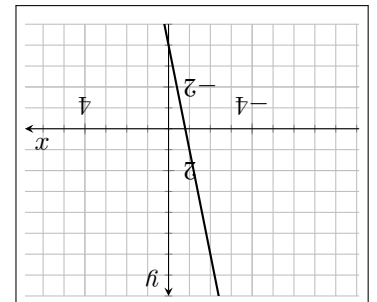
◦89'821

5. Ábrázold az egyenlettel megadott  $e$  egyenest!

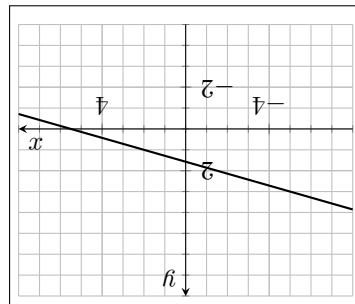
a)  $e: 2x+3y=1$



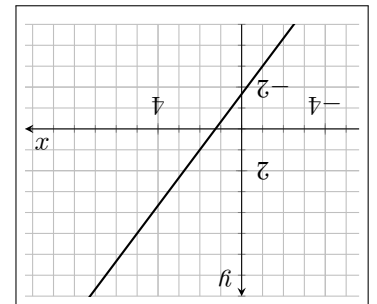
b)  $e: 5x+1y=-4$



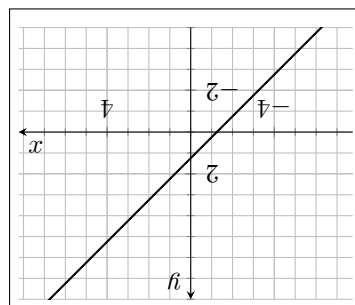
c)  $e: 2x+7y=11$



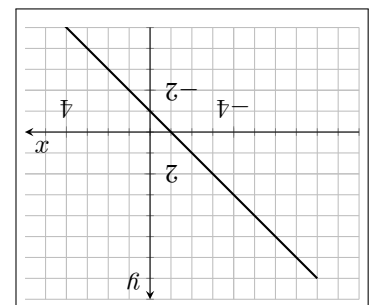
d)  $e: 4x-3y=5$



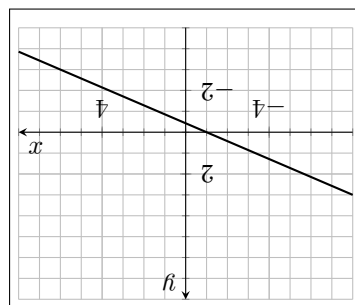
e)  $e: -4x+4y=5$



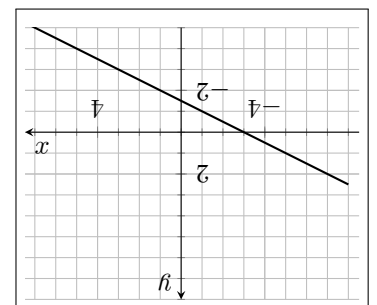
f)  $e: -4x-4y=4$



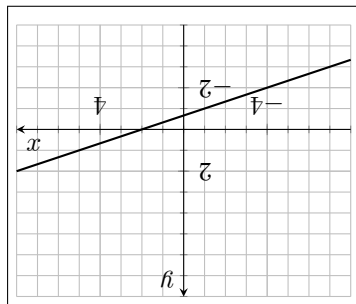
g)  $e: 3x+7y=-3$



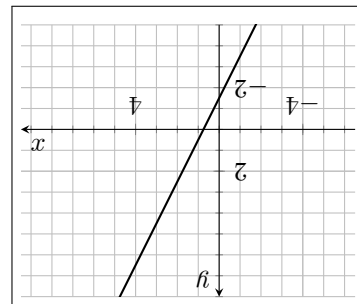
h)  $e: -1x-2y=3$



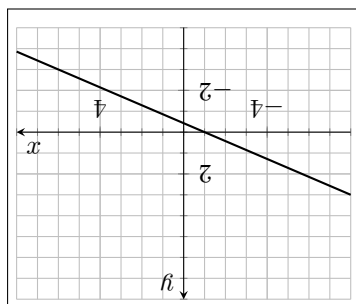
i)  $e : -1x + 3y = -2$



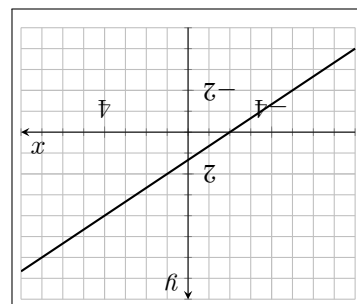
j)  $e : 4x - 2y = 3$



k)  $e : 3x + 7y = -3$



l)  $e : 2x - 3y = -4$



6. Írd fel az  $\vec{n}$  normálvektorú,  $P_0$  ponton átmenő egyenes egyenletét!

a)  $\vec{n}(2; 3), P_0(1; 4)$

$3x - 2y = -10$

b)  $\vec{n}(5; 1), P_0(-4; 3)$

$x - 5y = 17$

c)  $\vec{n}(2; 7), P_0(11; 10)$

$7x - 2y = -11$

d)  $\vec{n}(4; -3), P_0(5; 7)$

$3x - 4y = 11$

e)  $\vec{n}(-4; 4), P_0(5; -7)$

$4x - 4y = 38$

f)  $\vec{n}(-4; -4), P_0(4; 4)$

$4x + 4y = 32$

g)  $\vec{n}(3; 7), P_0(-3; 10)$

$7x - 3y = 31$

h)  $\vec{n}(-1; -2), P_0(3; 4)$

$x - 2y = 5$

i)  $\vec{n}(-1; 3), P_0(-2; 1)$

$3x - y = 5$

j)  $\vec{n}(4; -2), P_0(3; -4)$

$2x - 4y = 14$

k)  $\vec{n}(3; 7), P_0(-3; -1)$

$7x - 3y = 8$

l)  $\vec{n}(2; -3), P_0(-4; 0)$

$3x - 2y = 12$

7. Írd fel a  $\vec{v}$  irányvektorú,  $P_0$  ponton átmenő egyenes egyenletét!

a)  $\vec{v}(2; 3), P_0(1; 4)$

$3x - 2y = -10$

b)  $\vec{v}(5; 1), P_0(-4; 3)$

$x - 5y = 17$

c)  $\vec{v}(2; 7), P_0(11; 10)$

$7x - 2y = -11$

d)  $\vec{v}(4; -3), P_0(5; 7)$

$3x - 4y = 11$

e)  $\vec{v}(-4; 4), P_0(5; -7)$

$4x - 4y = 38$

f)  $\vec{v}(-4; -4), P_0(4; 4)$

$4x + 4y = 32$

g)  $\vec{v}(3; 7), P_0(-3; 10)$

$7x - 3y = 31$

h)  $\vec{v}(-1; -2), P_0(3; 4)$

$x - 2y = 5$

i) $\vec{v}(-1; 3), P_0(-2; 1)$	$\xi - = \hat{n}_1 + x \xi$	j) $\vec{v}(4; -2), P_0(3; -4)$	$01 = \hat{n}_7 - x \xi -$
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k) $\vec{v}(3; 7), P_0(-3; -1)$	$81 - = \hat{n}_8 - x \xi -$	l) $\vec{v}(2; -3), P_0(-4; 0)$	$21 = \hat{n}_7 - x \xi -$
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8. Írd fel az  $e$  egyenessel párhuzamos,  $P$  ponton áthaladó egyenes egyenletét!

a) $e : 1x + 3y = 10$ és $P(2; 4)$	$71 = \hat{n}_8 + x \xi$	b) $e : -4x + 1y = -7$ és $P(5; 3)$	$21 - = \hat{n}_1 + x \xi -$
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c) $e : 11x + 7y = 124$ és $P(2; 10)$	$26 = \hat{n}_2 + x \xi$	d) $e : 5x - 3y = 23$ és $P(4; 7)$	$1 - = \hat{n}_8 - x \xi$
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e) $e : 5x + 4y = -51$ és $P(-4; -7)$	$87 - = \hat{n}_7 + x \xi$	f) $e : 4x - 4y = 32$ és $P(-4; 4)$	$23 - = \hat{n}_7 - x \xi$
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g) $e : -3x + 7y = -9$ és $P(3; 10)$	$19 = \hat{n}_2 + x \xi -$	h) $e : 3x - 2y = 14$ és $P(-1; 4)$	$11 - = \hat{n}_7 - x \xi$
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i) $e : -2x + 3y = -5$ és $P(-1; 1)$	$\xi = \hat{n}_8 + x \xi -$	j) $e : 3x - 2y = -20$ és $P(4; -4)$	$02 = \hat{n}_7 - x \xi$
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k) $e : -3x + 7y = 24$ és $P(3; -1)$	$91 - = \hat{n}_2 + x \xi -$	l) $e : -4x - 3y = -6$ és $P(2; 0)$	$8 - = \hat{n}_8 - x \xi -$
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9. Írd fel az  $e$  egyenesre merőleges,  $P$  ponton áthaladó egyenes egyenletét!

a) $e : 3x + 2y = 10$ és $P(4; 1)$	$\xi = \hat{n}_8 - x \xi$	b) $e : 1x + 5y = -7$ és $P(3; -4)$	$61 = \hat{n}_1 - x \xi$
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c) $e : 7x + 2y = 124$ és $P(10; 11)$	$29 - = \hat{n}_2 - x \xi$	d) $e : -3x + 4y = 23$ és $P(7; 5)$	$87 = \hat{n}_8 + x \xi$
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e) $e : 4x - 4y = -51$ és $P(-7; 5)$	$8 = \hat{n}_7 - x \xi -$	f) $e : -4x - 4y = 32$ és $P(4; 4)$	$0 = \hat{n}_7 + x \xi -$
--------------------------------------	---------------------------	-------------------------------------	---------------------------

g) $e : 7x + 3y = -9$ és $P(10; -3)$	$19 = \hat{n}_2 - x \xi$	h) $e : -2x - 1y = 14$ és $P(4; 3)$	$2 = \hat{n}_7 + x \xi -$
--------------------------------------	--------------------------	-------------------------------------	---------------------------

i) $e : 3x - 1y = -5$ és $P(1; -2)$	$\xi = \hat{n}_8 - x \xi -$	j) $e : -2x + 4y = -20$ és $P(-4; 3)$	$01 - = \hat{n}_7 + x \xi$
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k) $e : 7x + 3y = 24$ és $P(-1; -3)$	$81 = \hat{n}_2 - x \xi$	l) $e : -3x + 2y = -6$ és $P(0; -4)$	$21 - = \hat{n}_8 + x \xi$
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10. Írd fel az  $AB$  szakasz felezőmerőlegesének egyenletét!

a)  $A(2; 3), B(1; 4)$

$$z - = h_{1-x}1$$

b)  $A(5; 1), B(-4; 3)$

$$1 = h_{z-x}6$$

c)  $A(2; 7), B(11; 10)$

$$78 - = h_{8-x}6 -$$

d)  $A(4; -3), B(5; 7)$

$$5z - = h_{01-x}1 -$$

e)  $A(-4; 4), B(5; -7)$

$$1z - = h_{11+x}6 -$$

f)  $A(-4; -4), B(4; 4)$

$$0 = h_{8-x}8 -$$

g)  $A(3; 7), B(-3; 10)$

$$9z - = h_{8-x}9$$

h)  $A(-1; -2), B(3; 4)$

$$01 - = h_{9-x}7 -$$

i)  $A(-1; 3), B(-2; 1)$

$$8 = h_{z+x}1$$

j)  $A(4; -2), B(3; -4)$

$$8 - = h_{z+x}1$$

k)  $A(3; 7), B(-3; -1)$

$$7z = h_{8+x}9$$

l)  $A(2; -3), B(-4; 0)$

$$z - = h_{8-x}9$$

11. Írd fel az  $A$  és  $B$  ponton átmenő egyenes egyenletét!

a)  $A(2; 3), B(1; 4)$

$$8 = h_{1+x}1$$

b)  $A(5; 1), B(-4; 3)$

$$61 = h_{6+x}z$$

c)  $A(2; 7), B(11; 10)$

$$28 - = h_{6-x}8$$

d)  $A(4; -3), B(5; 7)$

$$87 = h_{1-x}01$$

e)  $A(-4; 4), B(5; -7)$

$$8 = h_{6-x}11 -$$

f)  $A(-4; -4), B(4; 4)$

$$0 = h_{8-x}8$$

g)  $A(3; 7), B(-3; 10)$

$$18 = h_{9+x}8$$

h)  $A(-1; -2), B(3; 4)$

$$z = h_{7-x}9$$

i)  $A(-1; 3), B(-2; 1)$

$$8 = h_{1+x}z -$$

j)  $A(4; -2), B(3; -4)$

$$01 - = h_{1+x}z -$$

k)  $A(3; 7), B(-3; -1)$

$$81 = h_{9+x}8 -$$

l)  $A(2; -3), B(-4; 0)$

$$z1 - = h_{9+x}8$$

12. Határozd meg az  $e$  és  $f$  egyenes hajlásszögét!

a)

$$e: 1x+2y = 4$$

$$f: 3x+4y = 6$$

$$10,29^\circ$$

b)

$$e: -4x+5y = -3$$

$$f: 1x+3y = 8$$

$$60,28^\circ$$

c)

$$e: 11x+2y = 18$$

$$f: 7x+10y = 12$$

$$04,77^\circ$$

d)

$$e: 5x+4y = 2$$

$$f: -3x+7y = 11$$

$$74,54^\circ$$

e)

$$e: 5x-4y = 9$$

$$f: 4x-7y = -11$$

$$21,59^\circ$$

f)

$$e: 4x-4y = 0$$

$$f: -4x+4y = 0$$

$$081^\circ$$

g)

$$e: -3x+3y = 4$$

$$f: 7x+10y = 13$$

$$66,99^\circ$$

h)

$$e: 3x-1y = 1$$

$$f: -2x+4y = 3$$

$$135^\circ$$

i)	j)	k)	l)
$e: -2x-1y = 1$	$e: 3x+4y = 1$	$e: -3x+3y = 4$	$e: -4x+2y = -7$
$f: 3x+1y = 0$	$f: -2x-4y = 0$	$f: 7x-1y = 2$	$f: -3x+0y = 2$
$\boxed{171; 8121}$	$\boxed{89; 691}$	$\boxed{143; 120}$	$\boxed{95; 92}$

13. Határozd meg az  $e$  és  $f$  egyenesek metszéspontját!

a)	b)	c)	d)
$e: 2x+3y = 37$	$e: 5x+1y = -7$	$e: 2x+7y = 313$	$e: 4x-3y = -157$
$f: 1x+4y = 46$	$f: -4x+3y = 74$	$f: 11x+10y = 1066$	$f: 5x+7y = 137$
$\boxed{(11; 2)}$	$\boxed{(81; 5-)}$	$\boxed{(82; 92)}$	$\boxed{(18; 91-)}$
e)	f)	g)	h)
$e: -4x+4y = 48$	$e: -4x-4y = 120$	$e: 3x+7y = 165$	$e: -1x-2y = 9$
$f: 5x-7y = -122$	$f: 4x+4y = -120$	$f: -3x+10y = 396$	$f: 3x+4y = -25$
$\boxed{(18; 61)}$	$\boxed{(0; 308-)}$	$\boxed{(88; 22-)}$	$\boxed{(1-; 2-)}$
i)	j)	k)	l)
$e: -1x+3y = 13$	$e: 4x-2y = -2$	$e: 3x+7y = -66$	$e: 2x-3y = 13$
$f: -2x+1y = 16$	$f: 3x-4y = 31$	$f: -3x-1y = 66$	$f: -4x+0y = -44$
$\boxed{(2; 2-)}$	$\boxed{(81-; 2-)}$	$\boxed{(0; 22-)}$	$\boxed{(8; 11)}$

14. Írd fel a  $K$  középpontú,  $r$  sugarú kör egyenletét!

a) $K(2; 3), r = 1$	$\boxed{1 = \frac{1}{2}(\xi - \eta) + \frac{1}{2}(\zeta - x)}$	b) $K(5; 1), r = 4$	$\boxed{91 = \frac{1}{2}(\Gamma - \hat{\eta}) + \frac{1}{2}(\xi - x)}$
c) $K(2; 7), r = 11$	$\boxed{121 = \frac{1}{2}(\mathcal{L} - \hat{\eta}) + \frac{1}{2}(\zeta - x)}$	d) $K(4; -3), r = 5$	$\boxed{52 = \frac{1}{2}(\xi + \hat{\eta}) + \frac{1}{2}(\mathcal{V} - x)}$
e) $K(-4; 4), r = 5$	$\boxed{52 = \frac{1}{2}(\mathcal{V} - \hat{\eta}) + \frac{1}{2}(\mathcal{V} + x)}$	f) $K(-4; -4), r = 4$	$\boxed{91 = \frac{1}{2}(\mathcal{V} + \hat{\eta}) + \frac{1}{2}(\mathcal{V} + x)}$
g) $K(3; 7), r = 3$	$\boxed{6 = \frac{1}{2}(\mathcal{L} - \hat{\eta}) + \frac{1}{2}(\xi - x)}$	h) $K(-1; -2), r = 3$	$\boxed{6 = \frac{1}{2}(\zeta + \hat{\eta}) + \frac{1}{2}(\Gamma + x)}$
i) $K(-1; 3), r = 2$	$\boxed{\mathcal{V} = \frac{1}{2}(\xi - \hat{\eta}) + \frac{1}{2}(\Gamma + x)}$	j) $K(4; -2), r = 3$	$\boxed{6 = \frac{1}{2}(\zeta + \hat{\eta}) + \frac{1}{2}(\mathcal{V} - x)}$
k) $K(3; 7), r = 3$	$\boxed{6 = \frac{1}{2}(\mathcal{L} - \hat{\eta}) + \frac{1}{2}(\xi - x)}$	l) $K(2; -3), r = 4$	$\boxed{91 = \frac{1}{2}(\xi + \hat{\eta}) + \frac{1}{2}(\zeta - x)}$

15. Írd fel az  $AB$  átmérőjű kör egyenletét!

a)  $A(2; 3), B(1; 4)$

$$\mathfrak{z}'0 = \mathfrak{z}(\mathfrak{z}'\mathfrak{z}-\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'1-x)$$

b)  $A(5; 1), B(-4; 3)$

$$\mathfrak{z}'1\mathfrak{z} = \mathfrak{z}(\mathfrak{z}-\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'0-x)$$

c)  $A(2; 7), B(11; 10)$

$$\mathfrak{z}'\mathfrak{z}\mathfrak{z} = \mathfrak{z}(\mathfrak{z}'8-\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'9-x)$$

d)  $A(4; -3), B(5; 7)$

$$\mathfrak{z}'\mathfrak{z}\mathfrak{z} = \mathfrak{z}(\mathfrak{z}-\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'\mathfrak{z}-x)$$

e)  $A(-4; 4), B(5; -7)$

$$\mathfrak{z}'0\mathfrak{z} = \mathfrak{z}(\mathfrak{z}'1+\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'0-x)$$

f)  $A(-4; -4), B(4; 4)$

$$\mathfrak{z}\mathfrak{z} = \mathfrak{z}(0+\mathfrak{h}) + \mathfrak{z}(0+x)$$

g)  $A(3; 7), B(-3; 10)$

$$\mathfrak{z}'\mathfrak{z}'1\mathfrak{z} = \mathfrak{z}(\mathfrak{z}'8-\mathfrak{h}) + \mathfrak{z}(0+x)$$

h)  $A(-1; -2), B(3; 4)$

$$\mathfrak{z}\mathfrak{z} = \mathfrak{z}(1-\mathfrak{h}) + \mathfrak{z}(1-x)$$

i)  $A(-1; 3), B(-2; 1)$

$$\mathfrak{z}'\mathfrak{z}'1 = \mathfrak{z}(\mathfrak{z}-\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'1+x)$$

j)  $A(4; -2), B(3; -4)$

$$\mathfrak{z}'\mathfrak{z}'1 = \mathfrak{z}(\mathfrak{z}+\mathfrak{h}) + \mathfrak{z}(\mathfrak{z}'\mathfrak{z}-x)$$

k)  $A(3; 7), B(-3; -1)$

$$\mathfrak{z}\mathfrak{z} = \mathfrak{z}(\mathfrak{z}-\mathfrak{h}) + \mathfrak{z}(0+x)$$

l)  $A(2; -3), B(-4; 0)$

$$\mathfrak{z}'\mathfrak{z}'1\mathfrak{z} = \mathfrak{z}(\mathfrak{z}'1+\mathfrak{h}) + \mathfrak{z}(1+x)$$

16. Határozd meg a megadott kör egyenlete alapján a kör középpontjának koordinátáit és a kör sugarát!

a)  $k : x^2 + y^2 - 12x - 2y + 21 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'9)\mathfrak{z}$$

b)  $k : x^2 + y^2 - 10x + 8y + 32 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'\mathfrak{z})\mathfrak{z}$$

c)  $k : x^2 + y^2 - 28x - 22y + 217 = 0$

$$0\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'11;\mathfrak{z}'\mathfrak{z})\mathfrak{z}$$

d)  $k : x^2 + y^2 + 24x - 10y + 120 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'\mathfrak{z}1-)\mathfrak{z}$$

e)  $k : x^2 + y^2 + 32x - 10y + 232 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'9\mathfrak{z}-)\mathfrak{z}$$

f)  $k : x^2 + y^2 - 32x - 8y + 256 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'\mathfrak{z}1)\mathfrak{z}$$

g)  $k : x^2 + y^2 - 42x + 6y + 350 = 0$

$$0\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'-;\mathfrak{z}'1\mathfrak{z})\mathfrak{z}$$

h)  $k : x^2 + y^2 - 4x - 6y - 3 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'\mathfrak{z})\mathfrak{z}$$

i)  $k : x^2 + y^2 + 6x + 4y + 12 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'-\mathfrak{z}-)\mathfrak{z}$$

j)  $k : x^2 + y^2 + 16x - 6y + 57 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'\mathfrak{z}-)\mathfrak{z}$$

k)  $k : x^2 + y^2 - 42x + 6y + 449 = 0$

$$\mathfrak{z} = \mathfrak{z}, (\mathfrak{z}'-\mathfrak{z}1\mathfrak{z})\mathfrak{z}$$

l)  $k : x^2 + y^2 + 12x + 8y + 52 = 0$

$$0 = \mathfrak{z}, (\mathfrak{z}'-\mathfrak{z}-)\mathfrak{z}$$

17. Határozd meg a  $k$  kör és az  $e$  egyenes metszéspontjait!

a)  $k : (x-9)^2 + (y-5)^2 = 65$

$e : 6x + 4y = 22$

$$\begin{pmatrix} \mathfrak{z}'1 \\ \mathfrak{z}'5 \end{pmatrix} \mathfrak{z}\mathfrak{z} \\ (\mathfrak{z}'-\mathfrak{z}) \mathfrak{z}$$

b)  $k : (x-9)^2 + (y-9)^2 = 205$

$e : 8x + 10y = -2$

$$\begin{pmatrix} \mathfrak{z}'\mathfrak{z}- \\ \mathfrak{z}'-9 \end{pmatrix} \mathfrak{z}\mathfrak{z} \\ (\mathfrak{z}'-\mathfrak{z}) \mathfrak{z}$$

c)  $k : (x-19)^2 + (y-4)^2 = 100$

$e : 6x - 2y = 46$

$$\begin{pmatrix} 0\mathfrak{z}'1\mathfrak{z} \\ \mathfrak{z}'6 \end{pmatrix} \mathfrak{z}\mathfrak{z} \\ (\mathfrak{z}'\mathfrak{z}) \mathfrak{z}$$

d)  $k : (x-8)^2 + (y-27,5)^2 = 429,25$

$e : -1x - 4y = -33$

$$\begin{pmatrix} \mathfrak{z}'\mathfrak{z} \\ \mathfrak{z}'\mathfrak{z} \end{pmatrix} \mathfrak{z}\mathfrak{z} \\ (\mathfrak{z}'\mathfrak{z}) \mathfrak{z}$$

$$e) k : (x+7)^2 + (y+8,9375)^2 = 147,7539$$

$$e : -8x-5y = -5$$

$$\begin{matrix} (L-;G)zJW \\ (I;0)lJW \end{matrix}$$

$$f) k : (x+4)^2 + (y+0)^2 = 80$$

$$e : -4x-12y = -64$$

$$\begin{matrix} (F;F)zJW \\ (8;8-)lJW \end{matrix}$$

$$g) k : (x-20)^2 + (y-10,725)^2 = 529,52586$$

$$e : 20x+13y = 70$$

$$\begin{matrix} (0I;G-)zJW \\ (0I-;0I)lJW \end{matrix}$$

$$h) k : (x-1)^2 + (y-10,5)^2 = 46,25$$

$$e : -1x-6y = -27$$

$$\begin{matrix} (F;G)zJW \\ (8;G-)lJW \end{matrix}$$

$$i) k : (x-3)^2 + (y+0)^2 = 26$$

$$e : 6x+4y = -8$$

$$\begin{matrix} (I;Z-)zJW \\ (G-;Z)lJW \end{matrix}$$

$$j) k : (x+2)^2 + (y+0)^2 = 41$$

$$e : -9x-1y = -23$$

$$\begin{matrix} (F-;G)zJW \\ (G;Z)lJW \end{matrix}$$

$$k) k : (x-9)^2 + (y-2,44444)^2 = 155,86415$$

$$e : 9x+13y = -40$$

$$\begin{matrix} (I-;G-)zJW \\ (0I-;0I)lJW \end{matrix}$$

$$l) k : (x+1)^2 + (y-4)^2 = 25$$

$$e : 1x+3y = -4$$

$$\begin{matrix} (0;F-)zJW \\ (I-;I-)lJW \end{matrix}$$