An Ardteistiméireacht
Ardleibhéal Páipéar 2
An Chéimseata Chomhordanáideach

2017 C3	2014 C9	2012 C3
2017 C4	Sampla SEC 2014 C3	Sampla SEC 2012 C3
2016 C1	Sampla SEC 2014 C4	Sampla SEC 2012 C4
2016 C2	2013 C3	2011 C3
2015 C3	2013 C4	2011 C5
2015 C4	2012 C1	2010 C4
2014 C5	2012 C2	2010 C6

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An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Páipéar 2 Ceist 3
2017

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Is triantán é ABC agus is iad comhordanáidí A agus C ná $(0, 6)$ agus $(4, 2)$ faoi seach. Is é $G\left(\frac{2}{3}, \frac{4}{3}\right)$ meánlár an triantáin ABC.

Gearrann AG an líne BC ag an bpointe P.

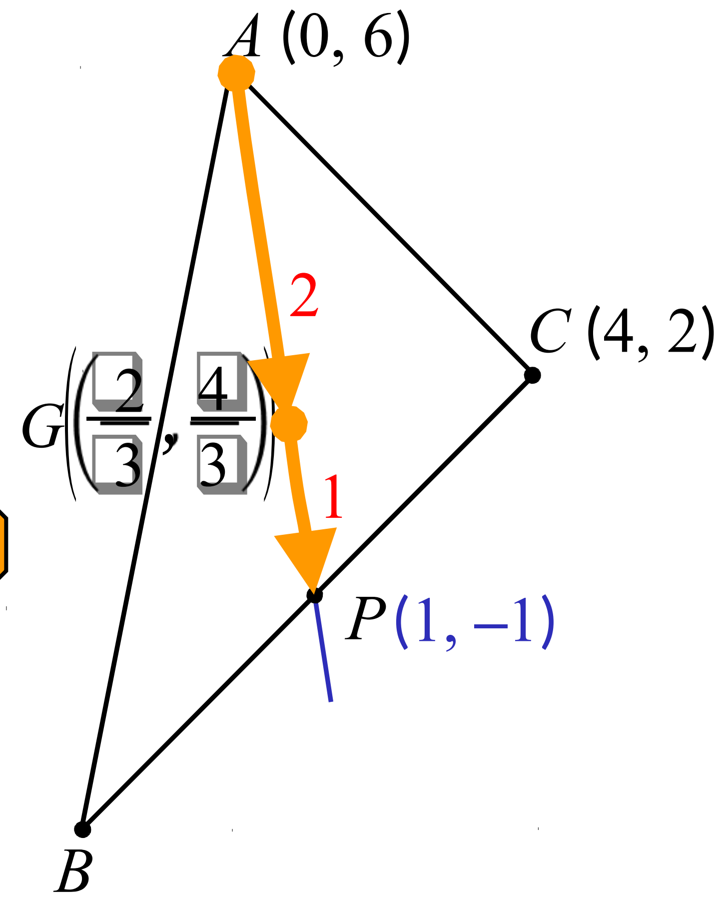
$|AG| : |GP| = 2 : 1.$

(a) Faigh comhordanáidí P.

$$A\,(0, 6) \xrightarrow{2} G\left(\frac{2}{3}, \frac{4}{3}\right) \xrightarrow{1} P(1, -1)$$

$$x:\ 0 \xrightarrow[+\frac{2}{3}]{2} \frac{2}{3} \xrightarrow[+\frac{1}{3}]{1} \frac{2}{3} + \frac{1}{3} = 1$$

$$y:\ 6 \xrightarrow[-\frac{14}{3}]{2} \frac{4}{3} \xrightarrow[-\frac{7}{3}]{1} \frac{4}{3} - \frac{7}{3} = -1$$



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Gearrann AG an líne BC ag an bpointe P.

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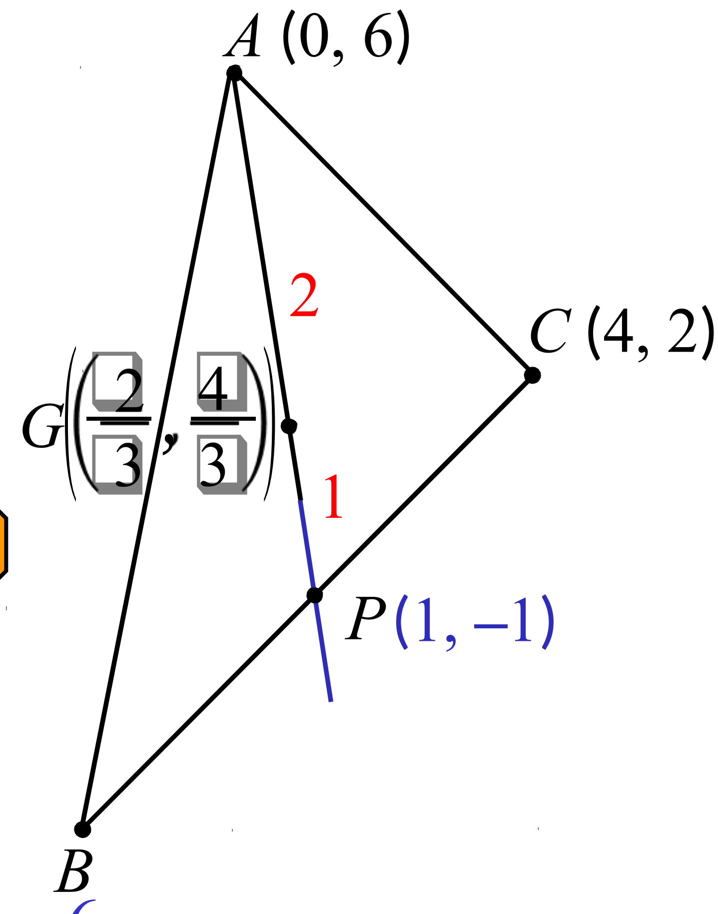
Modh eile



(a) Faigh comhordanáidí P.

$$A\,(0, 6) \xrightarrow{2} G\left(\frac{2}{3}, \frac{4}{3}\right) \xrightarrow{1} P\,(x, y)$$

$$(x, y) = \left(\frac{bx_1 + ax_2}{b + a}, \frac{by_1 + ay_2}{b + a}\right)$$

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$$G = \left(\frac{2x + 1(0)}{2 + 1}, \frac{2y + 1(6)}{2 + 1}\right) = \left(\frac{2}{3}, \frac{4}{3}\right)$$

$2x = 2$
$x = 1$

$2y + 6 = 4$

$2y = 4 - 6$
$y = -1$

Is triantán é ABC agus is iad comhordanáidí A agus C ná $(0, 6)$ agus $(4, 2)$ faoi seach. Is é $G\left(\frac{2}{3}, \frac{4}{3}\right)$ meánlár an triantáin ABC.

Gearrann AG an líne BC ag an bpointe P.

$|AG| : |GP| = 2 : 1$.

(b) Faigh comhordanáidí B.

$$C\,(4, 2) \xrightarrow{1} P\,(1, -1) \xrightarrow{1} B\,(-2, -4)$$

$$x: 4 \xrightarrow[-3]{} 1 \xrightarrow[-3]{} -2$$

$$y: 2 \xrightarrow[-3]{} -1 \xrightarrow[-3]{} -4$$

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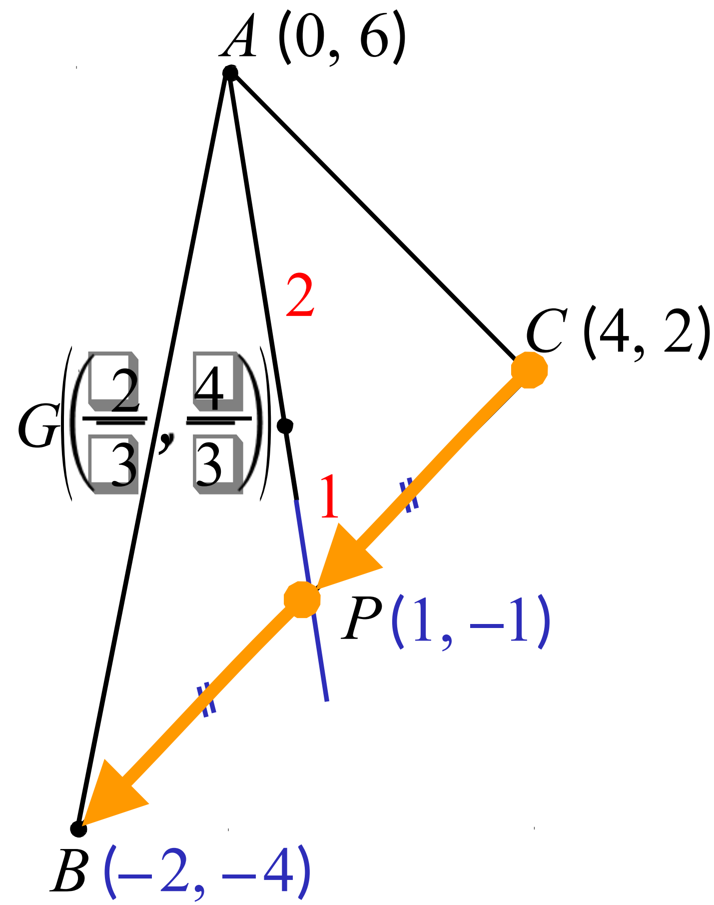
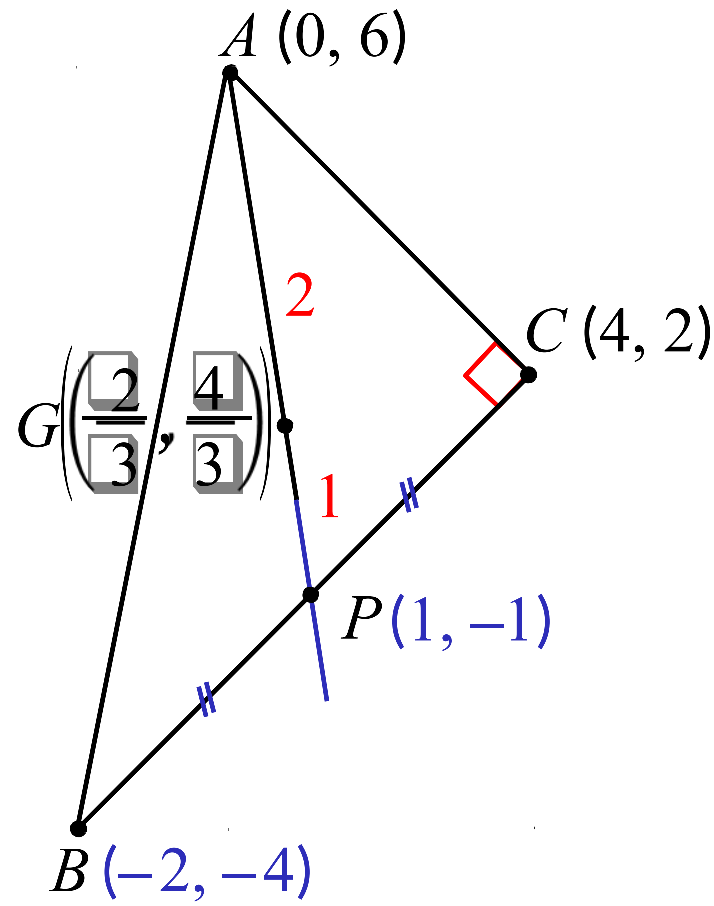


Is triantán é ABC agus is iad comhordanáidí A agus C ná (0, 6) agus (4, 2) faoi seach. Is é $G\left(\frac{2}{3}, \frac{4}{3}\right)$ meánlár an triantáin ABC. Gearrann AG an líne BC ag an bpointe P.

$|AG| : |GP| = 2 : 1$.



(c) Cruthaigh gurb é C ingearlár an triantáin ABC.

Más é C ingearlár an triantáin ABC, ansin is é [AC] airde [BC] agus is é [BC] airde [AC].

$$\text{Fána } AC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6-2}{0-4} = \frac{4}{-4} = -1$$

$$\text{Fána } BC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4-2}{-2-4} = \frac{-6}{-6} = 1$$

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$-1 \times 1 = -1 \ \therefore\ [AC] \perp [BC]$ agus is iad airdí ABC iad is é C ingearlár an triantáin ABC

Páipéar 2 Ceist 4
2017

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Is trí phointe ar chiorcal iad $A(0, 0)$, $B(6{\cdot}5, 0)$ agus $C(10, 7)$.

(a) Faigh cothromóid an chiorcail.

Cothromóid an chiorcail :

$$x^2 + y^2 + 2gx + 2fy + c = 0 \qquad x^2 + y^2 - 6{\cdot}5x - 12y = 0$$

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$(0, 0) \in$ den chiorcal: $0^2 + 0^2 + 2g(0) + 2f(0) + c = 0$

$$\Rightarrow c = 0$$

$(6{\cdot}5, 0) \in$ den chiorcal: $0^2 + 6{\cdot}5^2 + 2g(6{\cdot}5) + 2f(0) = 0$

$$\Rightarrow 42{\cdot}25 + 13g = 0$$

$$13g = -42{\cdot}25$$

$$g = \frac{-42{\cdot}25}{13} = -3{\cdot}25$$

$(10, 7) \in$ den chiorcal: $10^2 + 7^2 + 2(-3{\cdot}25)(10) + 2f(7) = 0$

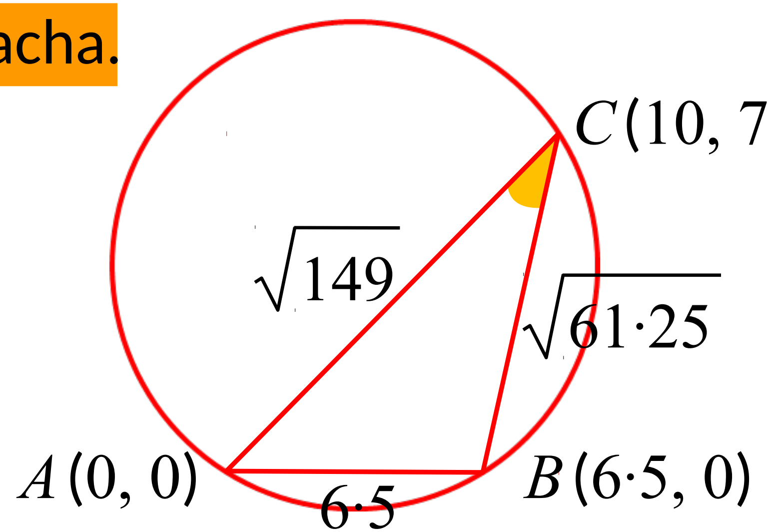
$$\Rightarrow 84 + 14f = 0$$

$$14f = -84$$

$$f = \frac{-84}{14} = -6$$

Is trí phointe ar chiorcal iad $A(0, 0)$, $B(6{\cdot}5, 0)$ agus $C(10, 7)$.

(b) Faigh $|\angle BCA|$. Bíodh do fhreagra ina céimeanna, ceart go dtí 2 ionad dheachúlacha.



$$\text{Fad} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$|AC| = \sqrt{(10 - 0)^2 + (7 - 0)^2}$$

$$= \sqrt{10^2 + 7^2} \qquad |AB| = 6{\cdot}5$$

$$= \sqrt{149}$$

$$|BC| = \sqrt{(10 - 6{\cdot}5)^2 + (7 - 0)^2}$$

$$= \sqrt{3{\cdot}5^2 + 7^2}$$

$$= \sqrt{61{\cdot}25}$$

Riail an chomhshínis:

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$6{\cdot}5^2 = 149 + 61{\cdot}25 - 2\sqrt{149}\sqrt{61{\cdot}25}\cos B$$

$$\cos B = \frac{149 + 61{\cdot}25 - 42{\cdot}25}{2\sqrt{149}\sqrt{61{\cdot}25}}$$

$$\cos B = 0{\cdot}8792919$$

$$|\angle BCA| = 28{\cdot}4429\ldots$$

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Páipéar 2 Ceist 1
2016

25 marc

$$a^2+2ab+b^2=(a+b)^2$$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Taispeántar na pointí $A(6, -2)$, $B(5, 3)$ agus $C(-3, 4)$ ar an léaráid.

(a) Faigh cothromóid na líne trí B atá ingearach le AC.

$$\text{Fána } AC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4-(-2)}{-3-6}$$

$$= \frac{6}{-9} = -\frac{2}{3}$$

$$\text{Fána ingearach} = \frac{3}{2}$$

$$y - y_1 = m(x - x_1)$$

$$(y - 3) = \frac{3}{2}(x - 5)$$

$$2y - 6 = 3x - 15$$

$$3x - 2y - 9 = 0$$

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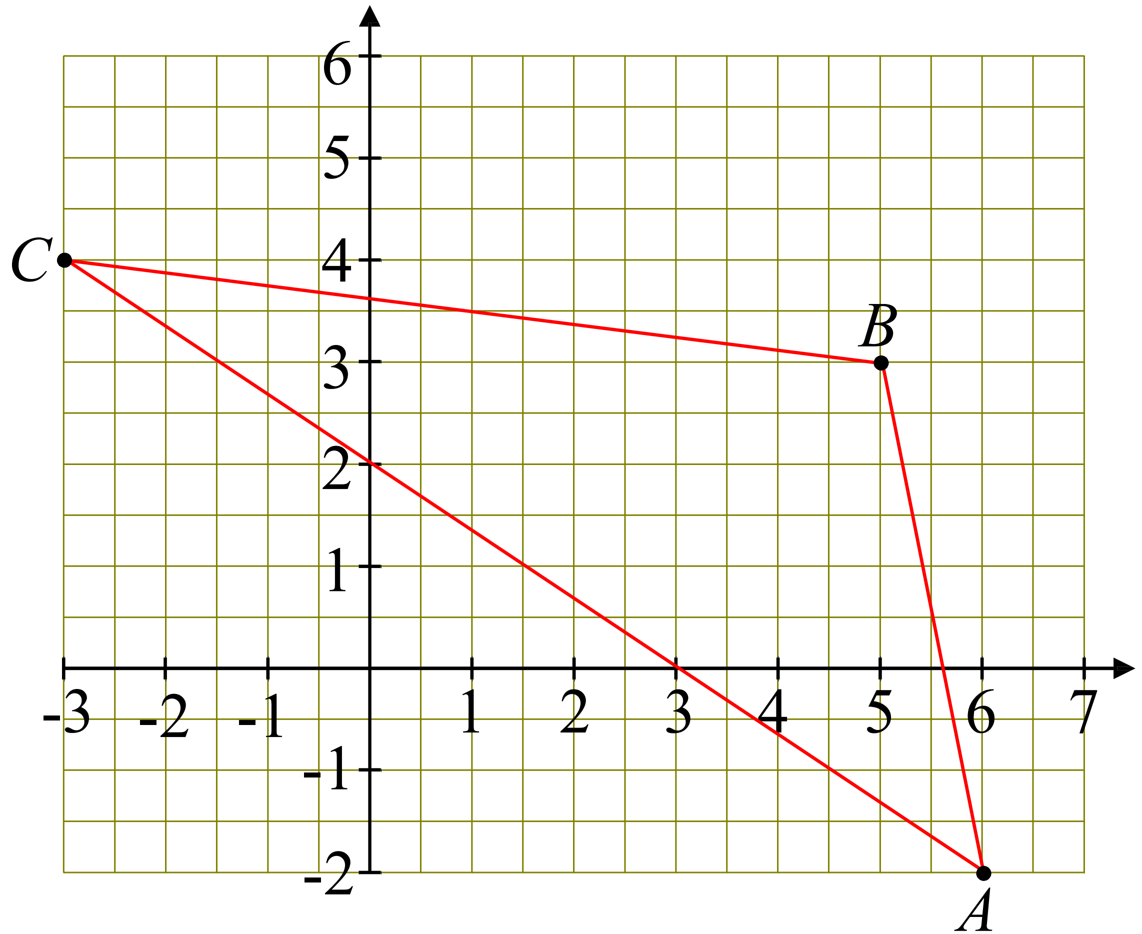
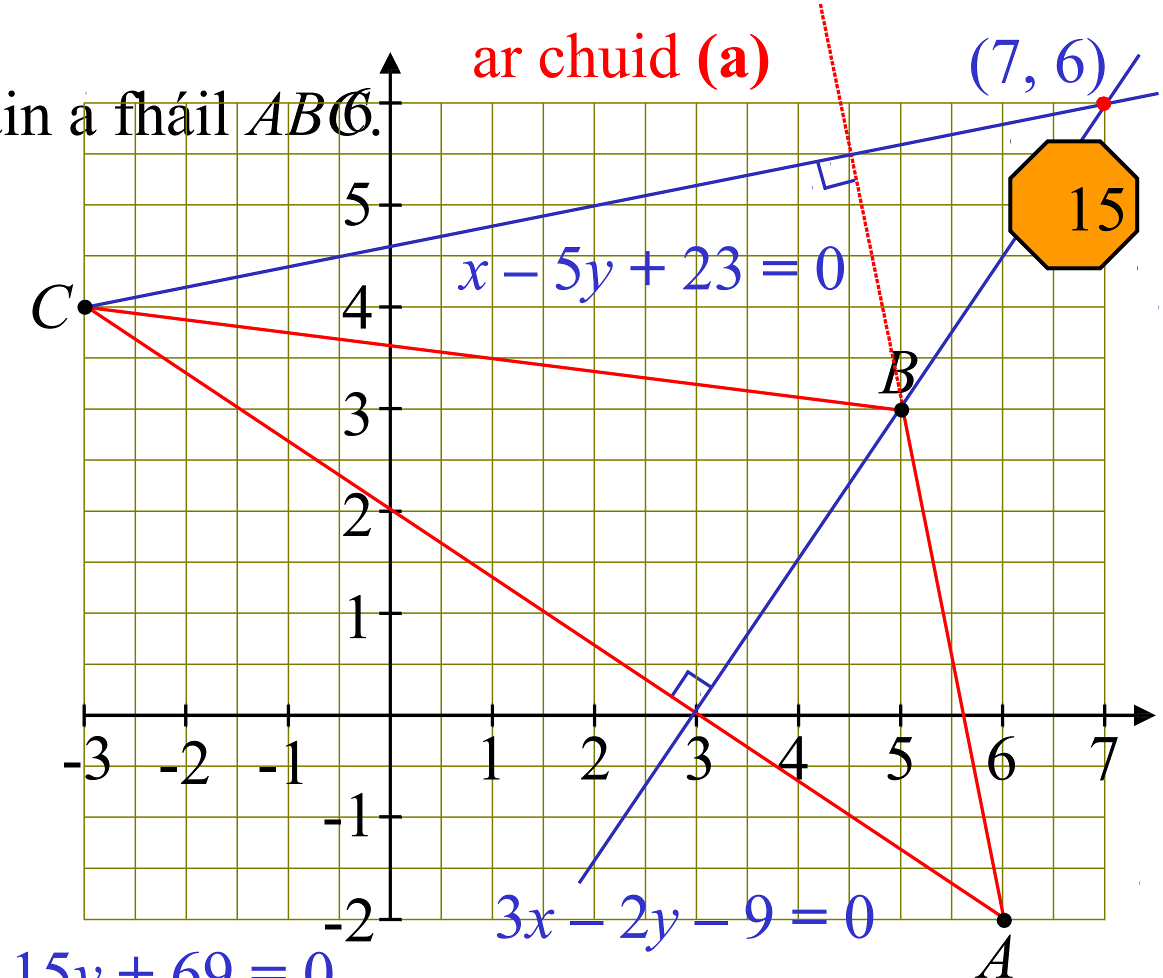


Taispeántar na pointí $A(6, -2)$, $B(5, 3)$ agus $C(-3, 4)$ ar an léaráid.

(b) Bain úsáid as do fhreagra ar chuid **(a)** thuas chun comhordanáidí ingearlár an triantáin a fháil ABC.



Fána $AB = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-2)}{5 - 6}$

$= \frac{5}{-1} = -5$

Fána ingearach $= \frac{1}{5}$

$y - y_1 = m(x - x_1)$

$(y - 4) = \frac{1}{5}(x + 3)$

$5y - 20 = x + 3$

$\times 3 \quad x - 5y + 23 = 0 \qquad 3x - 15y + 69 = 0$

$3x - 2y - 9 = 0$

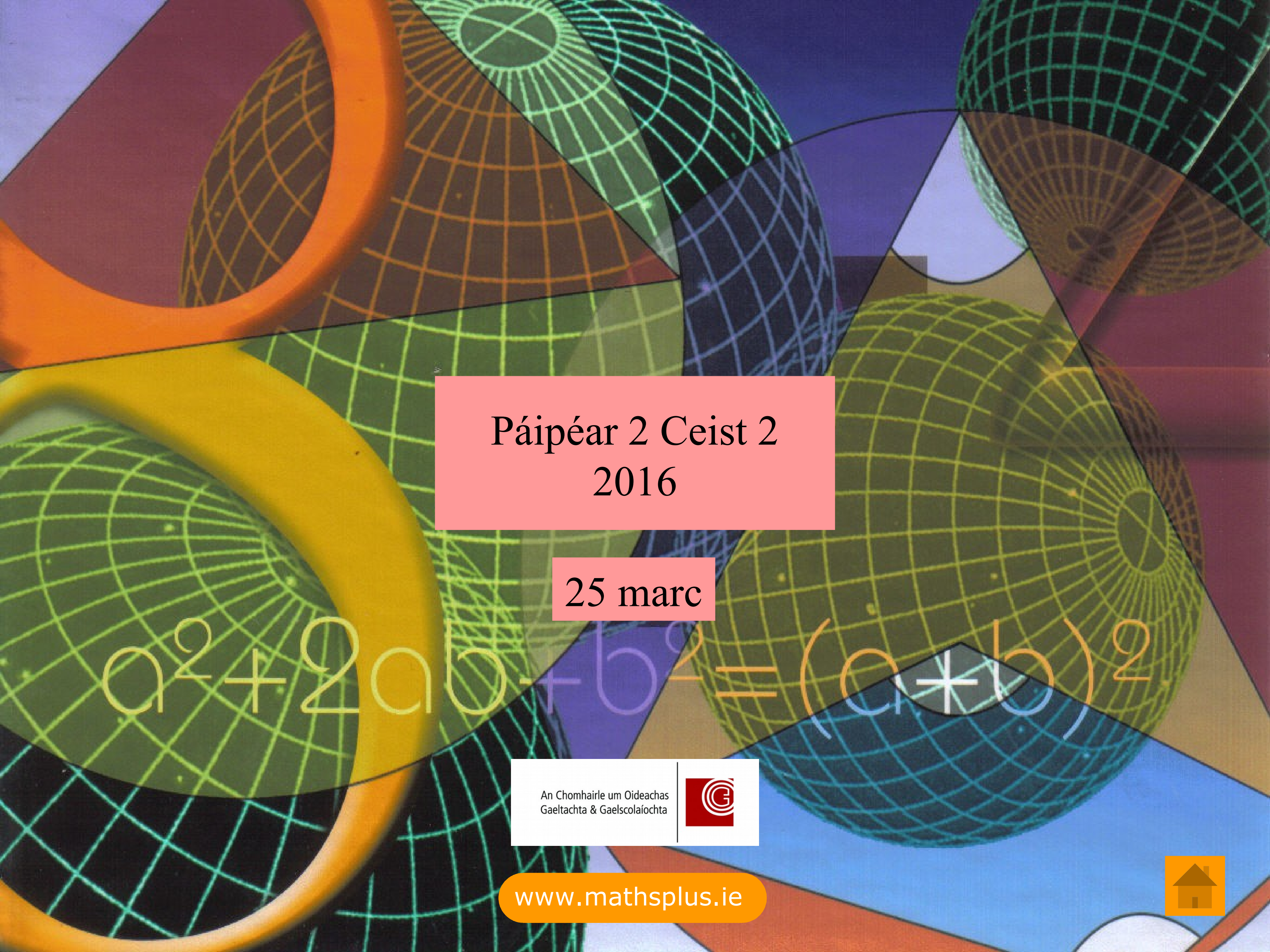
$-13y + 78 = 0 \Rightarrow y = 6$

$x - 5(6) + 23 = 0$

$x = 7$

Páipéar 2 Ceist 2
2016

25 marc



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Tá na comhordanáidí $(-1, 6)$ ag pointe X agus is é fána an line XC ná $\frac{1}{7}$.

(a) Faigh cothromóid XC. Bíodh do fhreagra san fhoirm $ax + by + c = 0$, áit a bhfuil $a, b, c \in \mathbb{Z}$.

$$y - y_1 = m(x - x_1)$$

$$(y - 6) = \frac{1}{7}(x + 1\ 1))$$

$$7y - 42 = x + 1$$

$$x - 7y + 43 = 0$$

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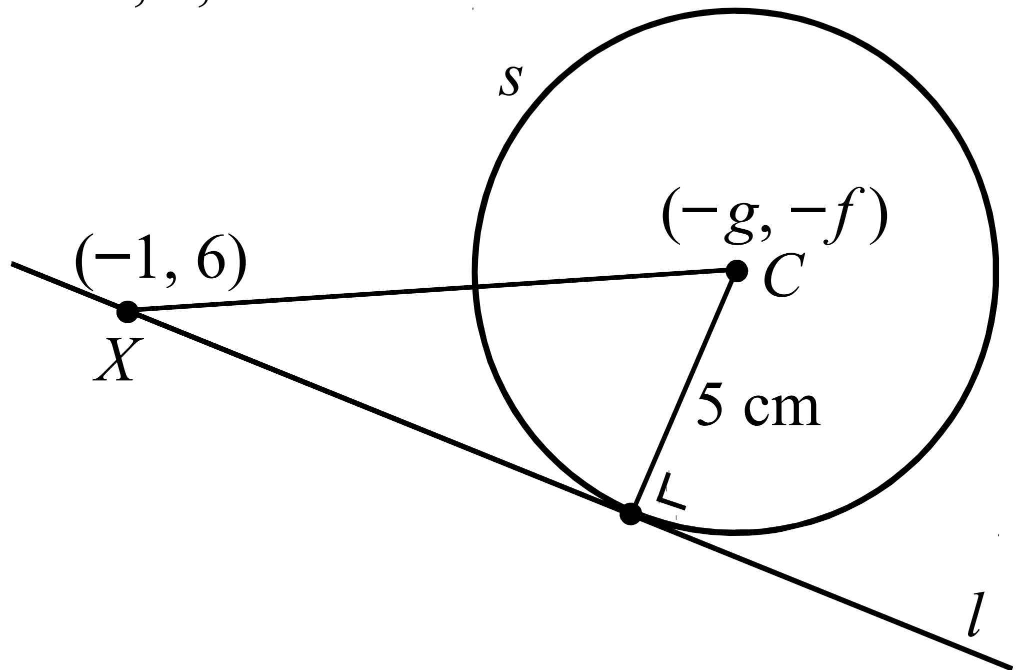

Tá na comhordanáidí $(-1, 6)$ ag pointe X agus is é fána an line XC ná $\frac{1}{7}$.

(b) Lárphointe ciorcail, s, é C. Tá ga 5 cm ag s.
Tá an líne l: $3x + 4y - 21 = 0$ ina tadhlaí le s agus gabhann sí trí X, mar a thaispeántar. Faigh cothromóid chiorcail s amháin dá leithéid.

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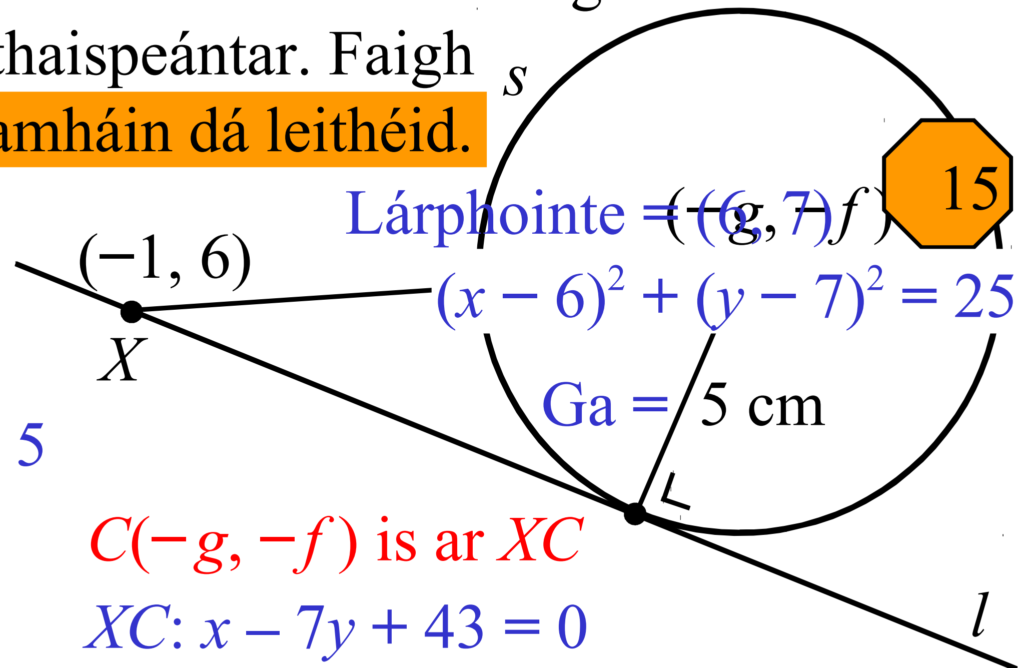


Lárphointe = $\cancel{(-g, -f)}\ (6, 7)$

$(x-6)^2 + (y-7)^2 = 25$

Ga = 5 cm

$$\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}} = d$$

$$\frac{|3(-g) + 4(-f) - 21|}{\sqrt{3^2 + 4^2}} = 5$$

$$\frac{|-3g - 4f - 21|}{\sqrt{25}} = 5(\ )$$

$-3g - 4f - 21 = \pm 25$

$-3g - 4f = 25 + 21$

$-3g - 4f = 46$

$-25f = 175 \Rightarrow -f = 7$

$C(-g, -f)$ is ar XC

XC: $x - 7y + 43 = 0$

$(-g) - 7(-f) + 43 = 0$

$-g + 7f + 43 = 0$

$-g + 7f = -43 \times 3$

$-3g + 21f = -129$

$-g + 7(-7) = -43 \Rightarrow -g = 6$

Páipéar 2 Ceist 3
2015

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

(a) Is iad comhordanáidí dhá phointe ná $A(4, -1)$ agus $B(7, t)$.
Tá an líne $l_1 : 3x - 4y - 12 = 0$ ingearach le AB.
Faigh luach t.

$$3x - 4y - 12 = 0 \Rightarrow y = \frac{3}{4}x + \frac{12}{4}$$

Fána l_1 $m = \frac{3}{4}$ Fána $AB = \frac{-4}{3}$

Cas bun os cionn agus athraigh an tsiombail

$$\text{Fána } AB = \frac{y_2 - y_1}{x_2 - x_1} = \frac{t - (-1)}{7 - 4} = \frac{t + 1}{3} = \frac{-4}{3}$$

$$\Rightarrow t + 1 = -4$$

$$t = -5$$

10

(x_1, y_1)

(b) Faigh, í dtéarmaí k, an fad idir an pointe $P(10, k)$ agus l_1.

$$l_1 : 3x - 4y - 12 = 0$$

$$\text{Fad Ingearach} = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

$$= \frac{|3(10) - 4(k) - 12|}{\sqrt{3^2 + (-4)^2}}$$

$$= \frac{|30 - 4k - 12|}{\sqrt{25}}$$

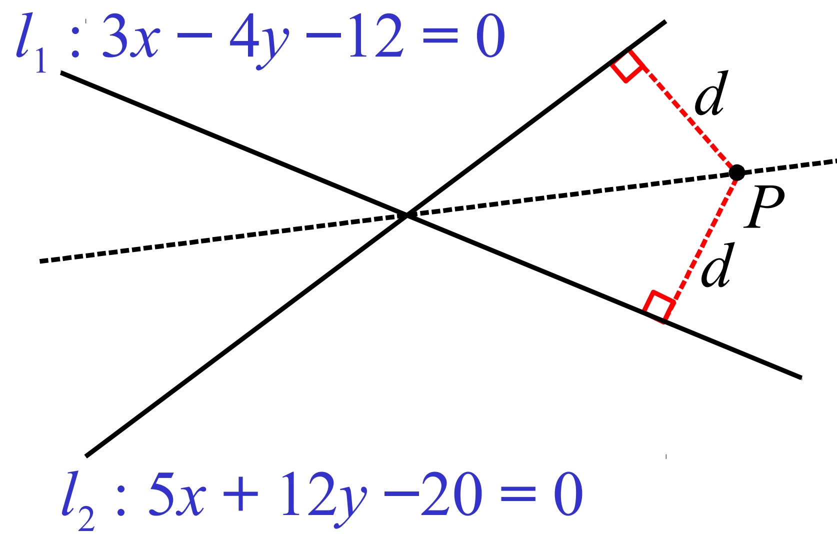
$$= \frac{|18 - 4k|}{5}$$

10

(c) Tá $P(10, k)$ ar dhéroinnteoir na n-uillinneacha idir na línte l_1 agus l_2: $5x + 12y - 20 = 0$.

(i) Faigh luachanna féideartha k.

$$d = \frac{|18 - 4k|}{5}$$ Cuid **(b)**



$$= \frac{|5(10) + 12(k) - 20|}{\sqrt{5^2 + 12^2}}$$

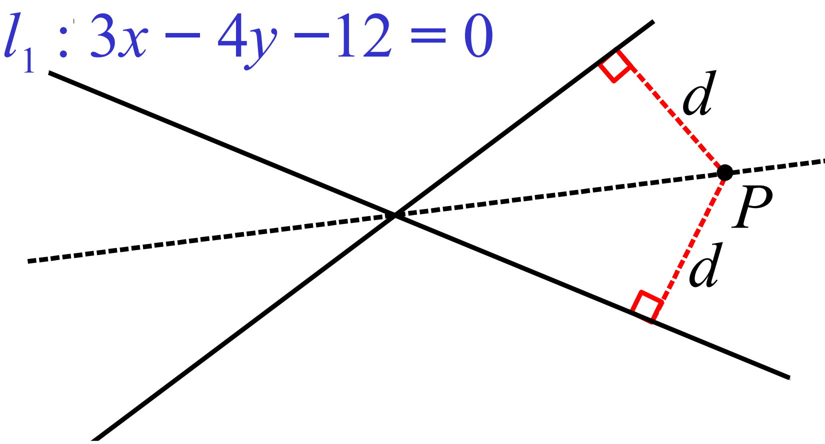
$$= \frac{|50 + 12k - 20|}{\sqrt{169}}$$

$$= \frac{|30 + 12k|}{13}$$

Fad Ingearach $= \dfrac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$

(c) Tá $P(10, k)$ ar dhéroinnteoir na n-uillinneacha idir na línte l_1 agus $l_2 : 5x + 12y - 20 = 0$.

(i) Faigh luachanna féideartha k.



$$\frac{|30 + 12k|}{13} = \frac{|18 - 4k|}{5}$$

$$\frac{(30 + 12k)}{13} = \pm\frac{(18 - 4k)}{5}$$

$5(30 + 12k) = 13(18 - 4k)$	$5(30 + 12k) = -13(18 - 4k)$
$150 + 60k = 234 - 52k$	$150 + 60k = -(234 - 52k)$
$60k + 52k = 234 - 150$	$60k - 52k = -234 - 150$
$112k = 84$	$8k = -384$
Roinn ag 112	Roinn ag 8
$k = \frac{3}{4}$	$k = -48$

(c) Tá $P(10, k)$ ar dhéroinnteoir na n-uillinneacha idir na línte l_1 agus $l_2: 5x + 12y - 20 = 0$.

(ii) Má tá $k > 0$, faigh an fad ó P go dtí an líne l_1 .

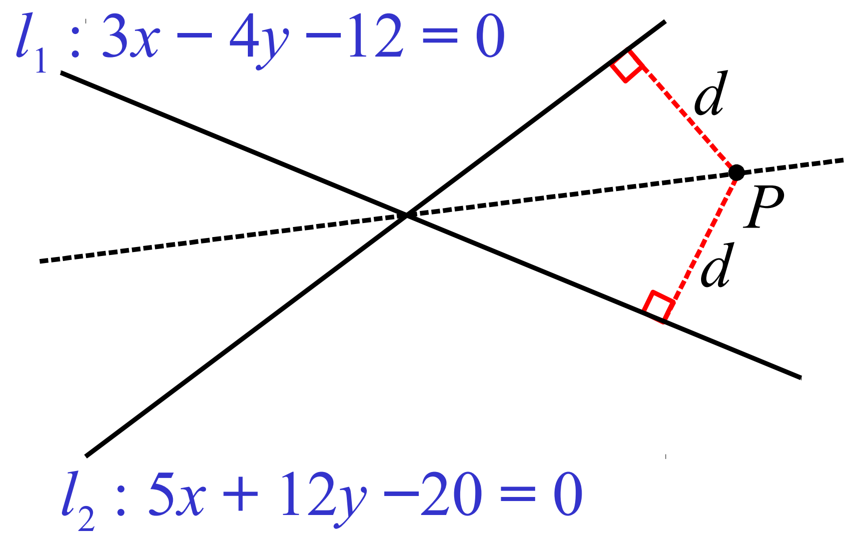
$$d = \frac{|18 - 4k|}{5} \quad \textbf{(b)}$$

$$k = \frac{3}{4} \quad \textbf{(c) (i)}$$

$$d = \frac{\left|18 - 4\left(\frac{3}{4}\right)\right|}{5}$$

$$= \frac{18 - 3}{5} = 3$$

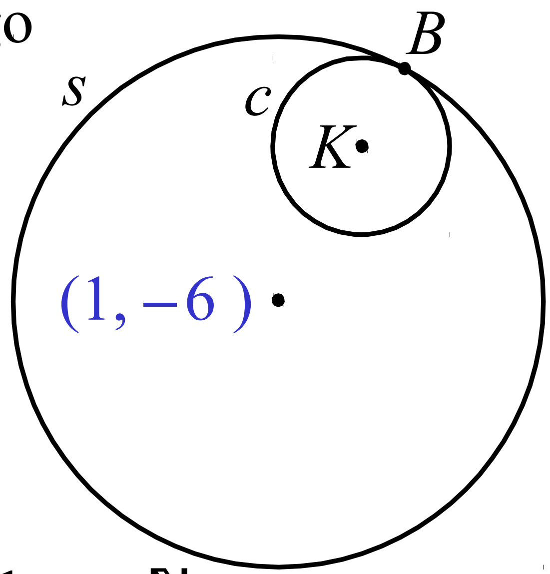
5



Páipéar 2 Ceist 4
2015

25 marc

Tá dhá chiorcal, s agus c, ag tadhall a chéile go hinmheánach ag B, mar a thaispeántar.



(a) Is é cothromóid an chiorcail s ná $(x-1)^2 + (y+6)^2 = 360$.

Scríobh síos comhordanáidí lárphointe s.

Lárphointe : $(1, -6)$

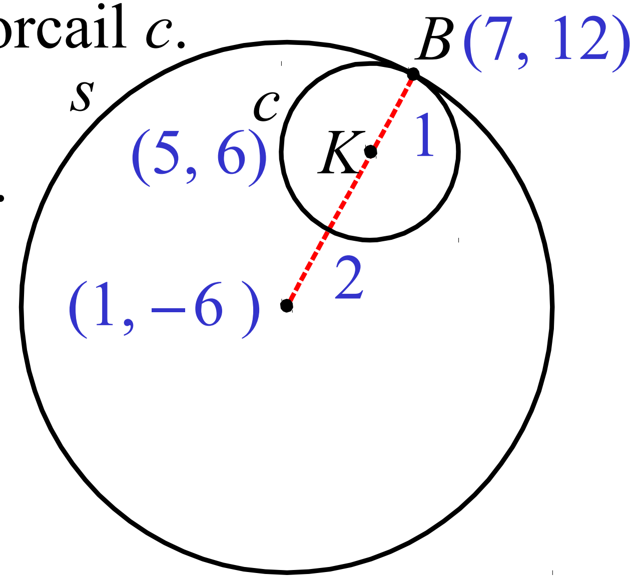
Scríobh síos ga s san fhoirm $a\sqrt{10}$, áit a bhfuil $a \in \mathbb{N}$.

Ga: $\sqrt{360} = 6\sqrt{10}$

5

Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x-h)^2 + (y-k)^2 = r^2$

(b) **(i)** Is é an pointe K lárphointe an chiorcail c.
Is ionann ga c agus trian de gha s.
Is iad comhordanáidí B ná (7, 12).
Faigh comhordanáidí K.



Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x - h)^2 + (y - k)^2 = r^2$

$$= \left(\frac{15}{3}, \frac{18}{3}\right) = (5,\ 6)$$

5

(b) **(ii)** Faigh cothromóid c.

$$\text{Ga} = \frac{1}{3}\,6\sqrt{10} = 2\sqrt{10}$$

$$(x-5)^2 + (y-6)^2 = (2\sqrt{10})^2$$

$$(x-5)^2 + (y-6)^2 = 40$$

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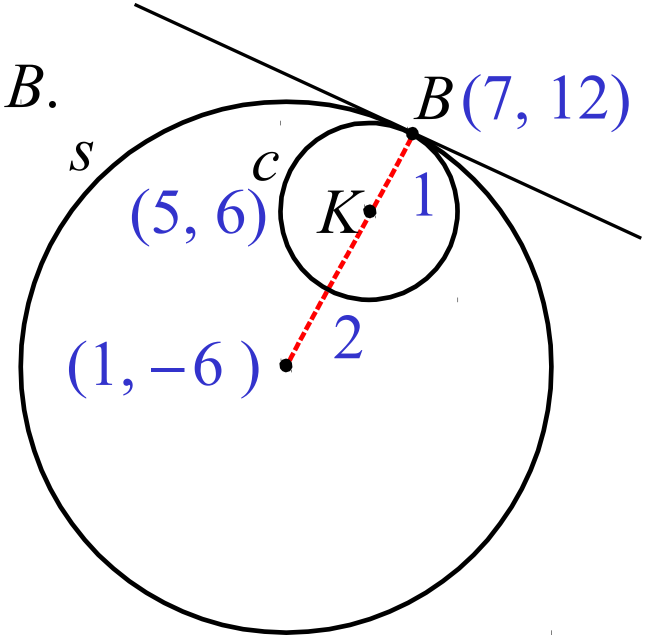
(c) Faigh cothromóid an chomhthadhlaí ag B. Bíodh do fhreagra san fhoirm $ax + by + c = 0$, áit a bhfuil $a, b, c \in \mathbb{Z}$.



$$(x-1)^2 + (y+6)^2 = 360 \Rightarrow \cancel{x^2} + \cancel{y^2} - 2x + 12y - 323 = 0$$

$$(x-5)^2 + (y-6)^2 = 40 \Rightarrow \cancel{x^2} + \cancel{y^2} + 10x + 12y - 21 = 0 \quad -$$

Roinn ag 8 $\quad 8x + 24y - 344 = 0$

$$x + 3y - 43 = 0$$

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Páipéar 2 Ceist 5
2014

25 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

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Trasnaíonn an líne RS an x-ais ag an bpointe R agus an y-ais ag an bpointe $S(0, 10)$, mar a thaispeántar. Is é achar an triantáin ROS, áit arb é O an bunphointe, ná $\dfrac{125}{3}$.

(a) Faigh comhordanáidí R.

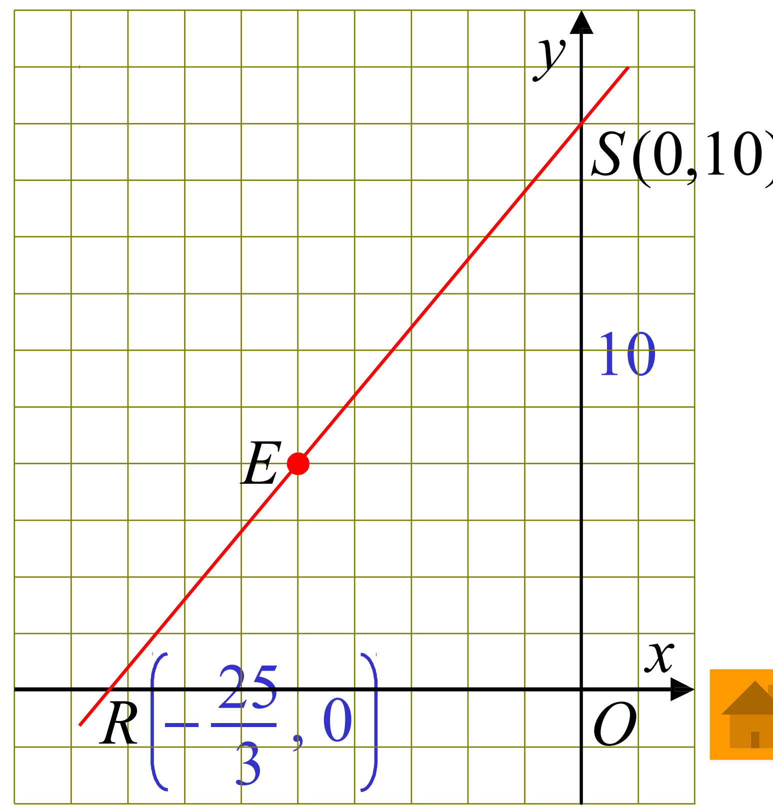
Achar triantáin $= \dfrac{1}{2}$ bonn × airde ingearach

$$\frac{125}{3} = \frac{1}{2} \times |RO| \times 10$$

$$|RO| = \frac{25}{3}$$

$$R = \left(-\frac{25}{3}, 0\right)$$

10



Trasnaíonn an líne RS an x-ais ag an bpointe R agus an y-ais ag an bpointe $S(0, 10)$, mar a thaispeántar. Is é achar an triantáin ROS, áit arb é O an bunphointe, ná $\dfrac{125}{3}$.

(b) Taispeáin go bhfuil an pointe $E(-5, 4)$ ar an líne RS.

Fána $= \dfrac{10-0}{0-\left(-\dfrac{25}{3}\right)} = \dfrac{6}{5}$ → m

Cothromóid líne : $y - y_1 = m(x - x_1)$

$$(y - 10) = \frac{6}{5}(x - 0)$$

$$5y - 50 = 6x$$

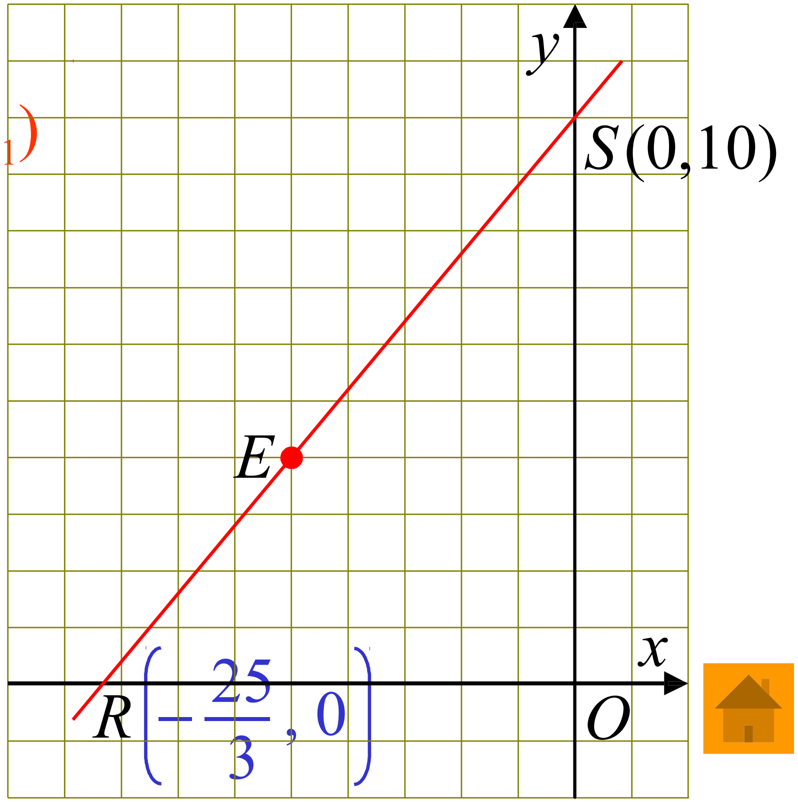
$$6x - 5y + 50 = 0$$

$$6(-5) - 5(4) + 50 = 0$$

$$-30 - 20 + 50 = 0$$

→ $E(-5, 4)$ ar an líne

10



Trasnaíonn an líne RS an x-ais ag an bpointe R agus an y-ais ag an bpointe $S(0, 10)$, mar a thaispeántar

Achar an triantáin reanna ar $(0, 0)$, (x_1, y_1) agus (x_2, y_2)

$$\text{Achar} = \frac{1}{2}|x_1y_2 - x_2y_1|$$

arb é O an bunphointe, ná $\dfrac{125}{3}$.

(c) Gabhann líne eile, $y = mx + c$, ... gh dhearfa, tríd an bpointe E agu... $\dfrac{125}{3}$ leis na haiseanna freisin. Faigh luach m agus luach c.

$$y = mx + c$$

$x = 0 \Rightarrow y = c \qquad y = 0 \Rightarrow x = -\dfrac{c}{m}$

$$\text{Achar} = \frac{1}{2}|(-\frac{c}{m})(c) - (0)(0)|$$

$$\frac{125}{3} = \frac{c2}{2m} \Rightarrow m = \frac{3c2}{250} \qquad m = \frac{8}{15}$$

$$4 = \frac{3c2}{250}(-5) + c$$

$$3c^2 - 50c + 200 = 0$$

$$(3c - 20)(c - 10) = 0$$

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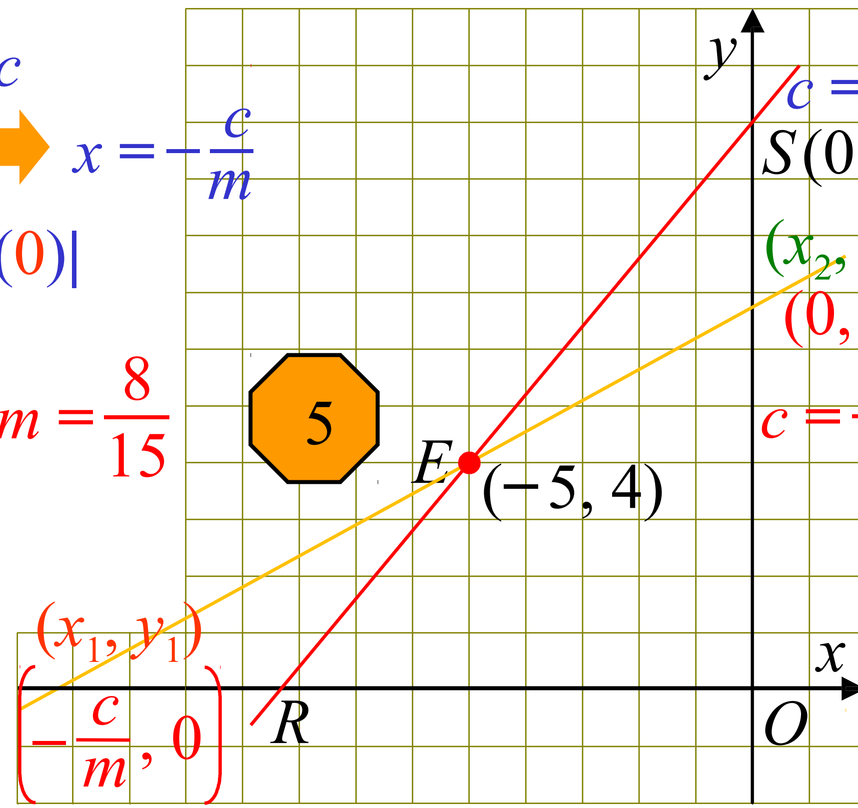


Páipéar 2 Ceist 9
2014

60 marc

$a^2+2ab+b^2=(a+b)^2$

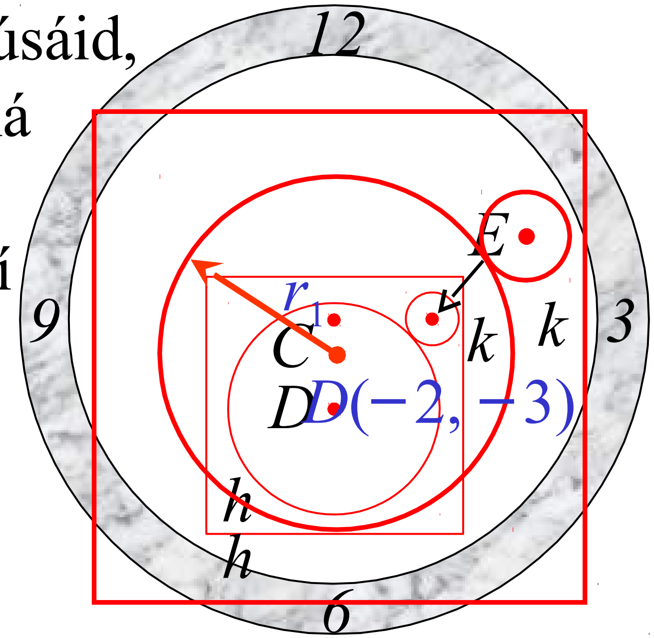
An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

(a) Sa léaráid taispeántar aghaidh cloig atá ciorclach. Níl na lámha ar taispeáint. As gloine atá an chuid chearnach d'aghaidh an chloig déanta agus is féidir an mheicníocht a fheiceáil. Taispeántar dhá fhiacail chiorclacha, *h* agus *k*, atá ag teagmháil lena chéile go seachtrach. Is é an pointe *C* an lárphointe d'aghaidh an chloig. Is é an pointe *D* lárphointe na fiacaile is mó, *h*, agus is é *E* lárphointe na fiacaile is lú, *k*.

(i) Agus comhordanáidí áirithe in úsáid, is é cothromóid an chiorcail *h* ná

$$x^2 + y^2 + 4x + 6y - 19 = 0$$

Faigh ga *h*, agus comhordanáidí a lárphointe, *D*.



$D = (-2, -3)$

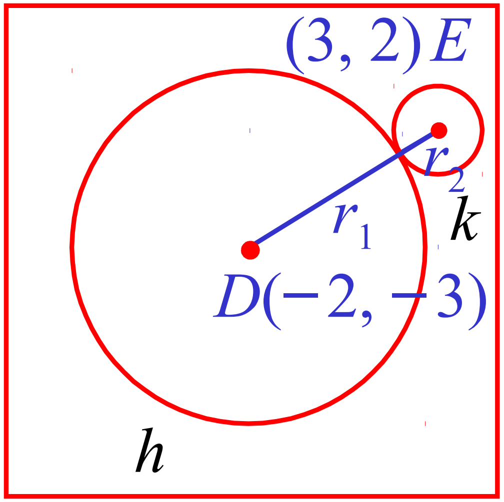
$r_1 = \sqrt{2^2 + 3^2 - (-19)} = 4\sqrt{2}$

10

(a) Sa léaráid taispeántar aghaidh cloig atá ciorclach. Níl na lámha ar taispeáint. As gloine atá an chuid chearnach d'aghaidh an chloig déanta agus is féidir an mheicníocht a fheiceáil. Taispeántar dhá fhiacail chiorclacha, *h* agus *k*, atá ag teagmháil lena chéile go seachtrach. Is é an pointe *C* an lárphointe d'aghaidh an chloig. Is é an pointe *D* lárphointe na fiacaile is mó, *h*, agus is é *E* lárphointe na fiacaile is lú, *k*.

(ii) Tá comhordanáidí (3, 2) ag an bpointe *E*.
Faigh ga an chiorcail *k*.

$$|DE| = \sqrt{(3+2)^2 + (2+3)^2}$$
$$= \sqrt{5^2 + 5^2}$$
$$= 5\sqrt{2}$$
$$|DE| = r_1 + r_2$$
$$r_2 = 5\sqrt{2} - 4\sqrt{2}$$
$$= \sqrt{2}$$



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(iii) Taispeáin gurb ionann an fad ó $C(-2, 2)$ go dtí an líne DE agus leathfhad $[DE]$.

Fána DE = $\dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{5}{5} = 1$

Cothromóid líne DE: $y - y_1 = m(x - x_1)$

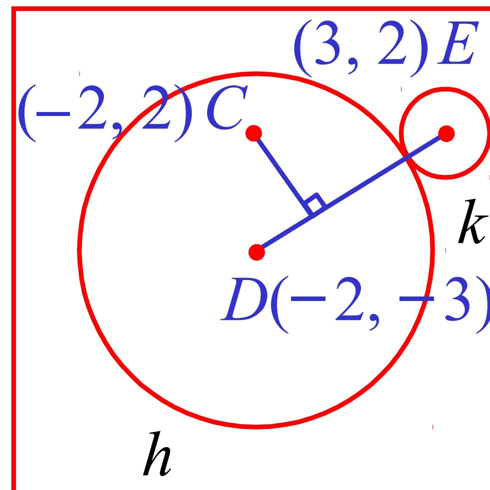
$$y - 2 = 1(x - 3)$$

$$x - y - 1 = 0$$

An fad ó C go dtí DE: $= \dfrac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$

$$= \frac{|1(-2) + (-1)(2) - 1|}{\sqrt{1^2 + (-1)^2}}$$

$$= \frac{5}{\sqrt{2}} = \frac{5\sqrt{2}}{2}$$



10 ∴ agus leathfhad $[DE]$

(iv) An t-aistriú a mhapálann lárphointe [*DE*] ar an bpointe *C*, déanann sé an ciorcal *k* a mhapáil ar an gciorcal *j*. Faigh cothromóid an chiorcail *j*.

$$\text{Lárphointe } DE = \left(\frac{-2+3}{2}, \frac{-3+2}{2}\right)$$

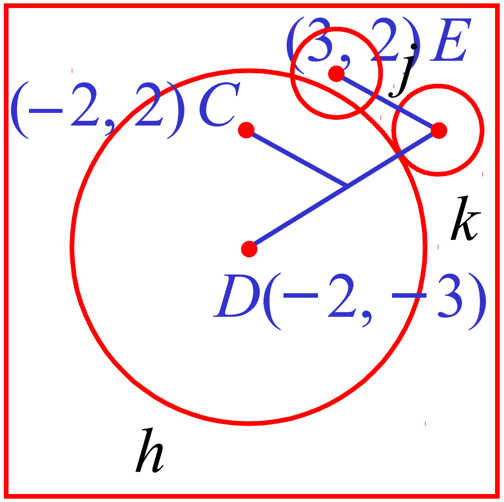
$$= (0{\cdot}5, -0{\cdot}5)$$

$$(0{\cdot}5, -0{\cdot}5) \rightarrow (-2, 2)$$

$$(3, 2) \rightarrow (0{\cdot}5, 4{\cdot}5)$$

$$\rightarrow (x - 0{\cdot}5)^2 + (y - 4{\cdot}5)^2 = 2$$

5



(v) Tá fad l sna sleasa ar an gcearnóg ngloine. Faigh an tslánuimhir is lú l sa tslí gur féidir an dá fhiacail a fheiceáil ina n-iomláine tríd an ngloine.

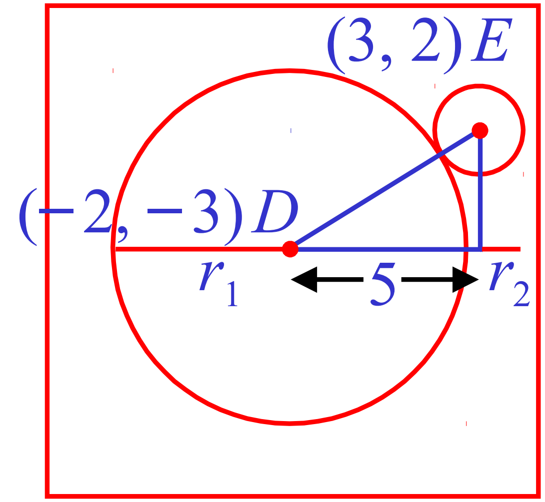
$$l > r_1 + 5 + r_2$$

$$l > 4\sqrt{2} + 5 + \sqrt{2}$$

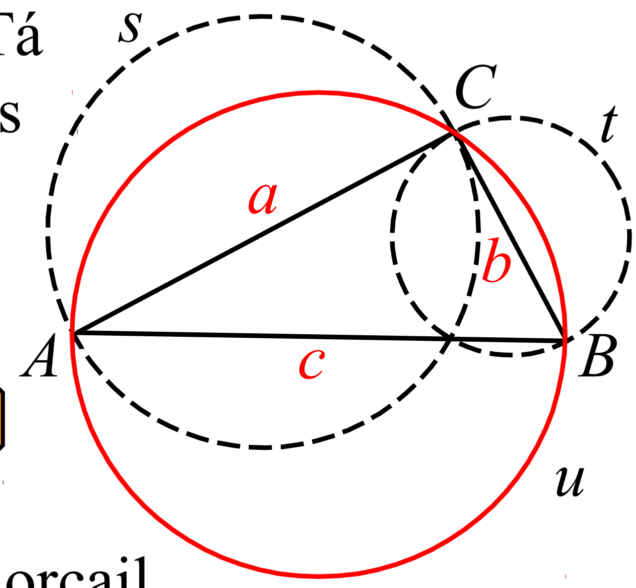
$$l > 12 \cdot 07$$

$$l = 13$$

5



(b) Tá dronuillinn sa triantán ABC ag C. Tá trastomhas [AC] ag an gciorcal s agus tá trastomhas [CB] ag an gciorcal t.



(i) Tarraing an ciorcal u a bhfuil trastomhas [AB] aige.

5

(ii) Cruthaigh go bhfuil achar an chiorcail u cothrom le suim na n-achar sna ciorcail s agus t.

Teoirim Phíotagarás

$$a^2 + b^2 = c^2 \quad \text{méadaigh ag } \frac{\pi}{4}$$

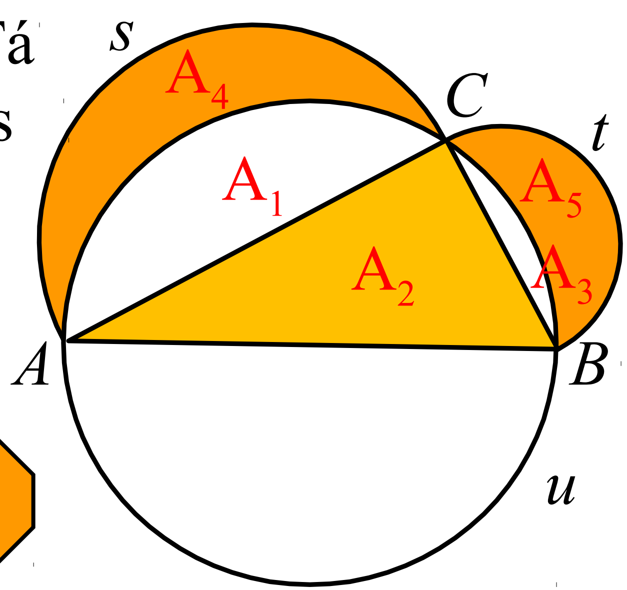
$$\frac{\pi}{4}(a^2 + b^2) = \frac{\pi}{4}c^2$$

$$\pi\left(\frac{a}{2}\right)^2 + \pi\left(\frac{b}{2}\right)^2 = \pi\left(\frac{c}{2}\right)^2$$

Achar s + Achar t = Achar u

5

(b) Tá dronuillinn sa triantán *ABC* ag *C*. Tá trastomhas [*AC*] ag an gciorcal *s* agus tá trastomhas [*CB*] ag an gciorcal *t*.



Achar *s* + Achar *t* = Achar *u*

$$A_4 + \cancel{A_1} + \cancel{A_3} + A_5 = \cancel{A_1} + A_2 + \cancel{A_3}$$

$$A_4 + A_5 = A_2$$

5

(iii) Sa léaráid taispeántar an triantán dronuilleach *ABC* agus stuanna de chuid na gciorcal *s*, *t* agus *u*.
Corrán a thugtar ar gach ceann de na limistéir scáthaithe sa léaráid. Limistéir iad atá cuimsithe ag na stuanna de chuid na gciorcal agus atá cosúil le corrán gealaí.
Cruthaigh go bhfuil suim an achair sa dá chorrán scáthaithe cothrom le hachar an triantáin *ABC*.

Páipéar 2 Ceist 3
2014 Sampla SEC

25 marc

$$a^2+2ab+b^2=(a+b)^2$$

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(a) Taispéain go bhfuil, agus $k \in \mathbb{R}$, an pointe $P(4k-2,\ 3k+1)$ ar an líne $l_1 : 3x - 4y + 10 = 0$.

Cuirtear an pointe sa chothromóid

$$3(4k-2) - 4(3k+1) + 10$$

5

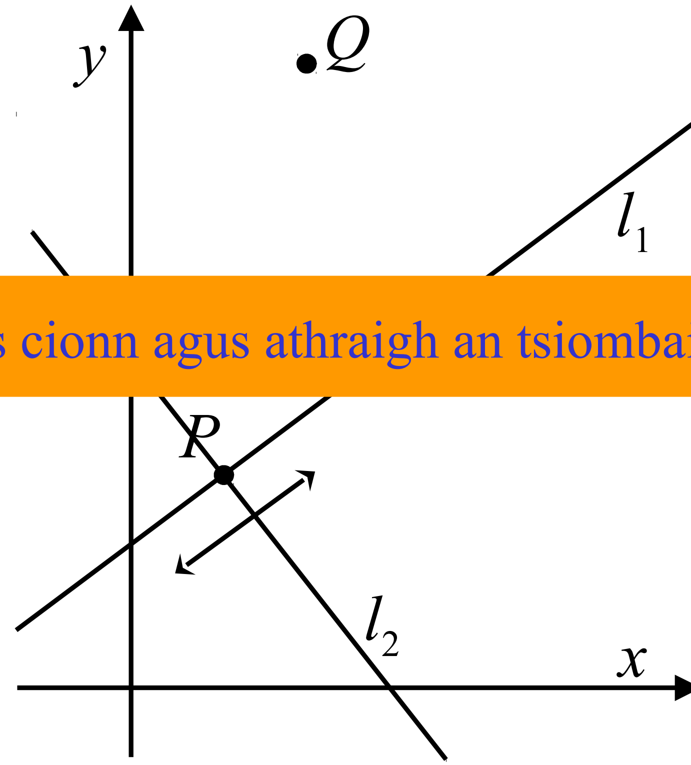
$$12k - 6 - 12k - 4 + 10 =$$

Cas bun os cionn agus athraigh an tsiombail

$\therefore$ Tá P ar an líne l_1

$$3x - 4y + 10 = 0 \Rightarrow y = \frac{3}{4}x - \frac{10}{4}$$

Fána l_1 / l_2 $m = \frac{3}{4}$ / $m = \frac{-4}{3}$



Cothromóid líne: $y - y_1 = m(x - x_1)$

(b) Gabhann an line l_2 trí P, agus tá sí ingearach leis an líne l_1. Faigh cothromóid l_2 i dtearmaí k.

$$(y - (3k+1)) = \frac{-4}{3}(x - (4k-2))$$

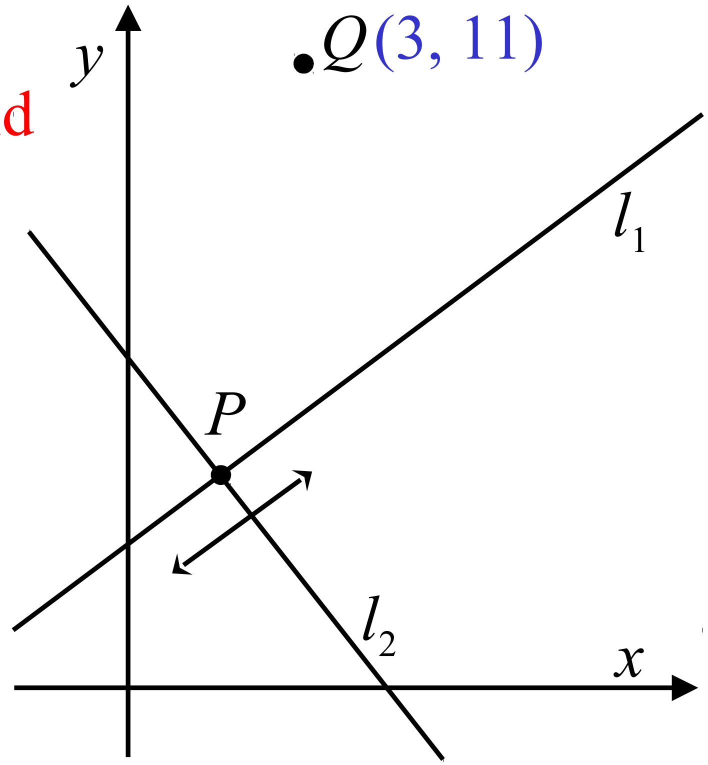
10

$$3y - 9k - 3 = -4x + 16k - 8 \quad 0$$

Athchóirigh

$$4x + 3y - 25k + 5 = 0$$

(c) Faigh an luach ar k má ghabhann l_2 tríd an bpointe $Q(3, 11)$.



Cuirtear an pointe Q sa chothromóid

$$4x + 3y - 25k + 5 = 0$$

$$4(3) + 3(11) - 25k + 5 = 0$$

$$12 + 33 - 25k + 5 = 0$$

$$25k = 50$$

$$k = 2$$

5

(d) Uaidh sin, nó ar shlí eile, faigh comhordanáidí bhun an ingir ó Q go l_1.

$$P = (4k - 2, 3k + 1) = (4(2) - 2, 3(2) + 1) = (6, 7)$$

5

Páipéar 2 Ceist 4
2014 Sampla SEC

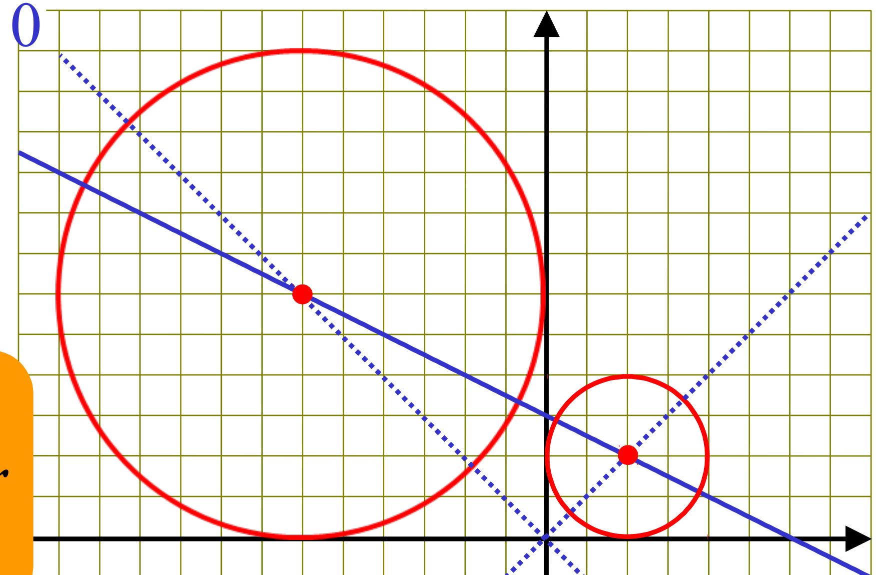
25 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Tá lárphointe ciorcail ar an líne $x + 2y - 6 = 0$. Is tadhlaithe leis an gciorcal iad an x-ais agus an y-ais. Leanann dhá ciorcail na coinníollacha seo. Faigh a chuid cothromóidí.

Lárphointe ar an líne $x + 2y - 6 = 0$

Más tadhlaithe leis an gciorcal iad an x-ais agus an y-ais, ba chóir go mbeadh na haiseanna sin ar comhfhad ó lár an



Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x-h)^2 + (y-k)^2 = r^2$

Nuair atá $x = y$ ➡ $x + 2x - 6 = 0$

$3x - 6 = 0$

$x = 2$

Lár $= (2, 2)$

$(x-2)^2 + (y-2)^2 = 2^2$

$x^2 + y^2 - 4x - 4y + 4 = 0$

Nuair atá $x = -y$ ➡ $x - 2x - 6 = 0$

$-x - 6 = 0$

$x = -6$

Lár $= (-6, 6)$

$(x+6)^2 + (y-6)^2 = 6^2$

$x^2 + y^2 + 12x - 12y + 36 = 0$

25

Páipéar 2 Ceist 3
2013

25 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

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Tá cothromóid sé líne éagsúla tugtha thall.

Líne	Cothromóid
h	$x = 3 - y$
i	$2x - 4y = 3$
k	$y = -\frac{1}{4}(2x - 7)$
l	$4x - 2y - 5 = 0$
m	$x + \sqrt{3}y - 10 = 0$
n	$\sqrt{3}x + y - 10 = 0$

(a) Comhlánaigh an tábla thíos agus an cuntas a thugtar á mheaitseáil le líne amháin nó níos mó.

Cuntas	**Líne/Línte**
Líne a bhfuil fána 2 aici.	
Líne a thrasnaíonn an y-ais ag $(0, -2\frac{1}{2})$.	
Líne a dhéanann idirlínte cothroma ar na haiseanna.	
Líne a dhéanann uillinn $150°$ le treo deimhneach na x-aise.	
Dhá líne atá ingearach lena chéile.	

Tá cothromóid sé líne éagsúla tugtha thall.

Líne a dhéanann idirlínte cothroma ar na haiseanna. (0, 3) (–3, 0)

Dhá líne atá ingearach lena chéile.

Líne a thrasnaíonn an y-ais ag $(0, -2\frac{1}{2})$. Líne a bhfuil fána 2 aici.

Líne a dhéanann uillinn 150˚ le treo deimhneach na x-aise.

$\tan 150^{\circ} = -\frac{1}{\sqrt{3}}$

Líne	Cothromóid
h	$x + y = 3$ $y = 3 - x$
i	$2x - \frac{1}{2}y = \frac{3}{4}$
k	$y = -\frac{1}{4}(2x + 7)$ $y = -\frac{1}{2}x - \frac{7}{4}$
l	$4x - 2y - 5 = 0$ $y = 2x - \frac{5}{2}$
m	$x + \sqrt{3}y + 10 = 0$ $y = -\frac{1}{\sqrt{3}}x - \frac{10}{\sqrt{3}}$
n	$\sqrt{3}x - y + 10 = 0$ $y = \sqrt{3}x + 10$

(a) Comhlánaigh an tábla thíos agus an cuntas a thugtar á mheaitseáil le líne amháin nó níos mó. 15

Cuntas	**Líne/Línte**
Líne a bhfuil fána 2 aici.	l
Líne a thrasnaíonn an y-ais ag $(0, -2\frac{1}{2})$.	l
Líne a dhéanann idirlínte cothroma ar na haiseanna.	h
Líne a dhéanann uillinn $150°$ le treo deimhneach na x-aise.	m
Dhá líne atá ingearach lena chéile.	k agus l

(b) Faigh an ghéaruillinn idir na línte *m* agus *n*.

$$\tan\theta = \pm\frac{m_1 - m_2}{1 + m_1 m_2}$$

$$x + \sqrt{3}y - 10 = 0 \Rightarrow y = -\frac{1}{\sqrt{3}}x + \frac{10}{\sqrt{3}} \Rightarrow m_1 = -\frac{1}{\sqrt{3}}$$

$$\sqrt{3}x + y - 10 = 0 \Rightarrow y = -\sqrt{3}x + 10 \Rightarrow m_2 = -\sqrt{3}$$

$$\tan\theta = \frac{-\frac{1}{\sqrt{3}} - \left(-\sqrt{3}\right)}{1 + \left(-\frac{1}{\cancel{\sqrt{3}}}\right)\left(-\cancel{\sqrt{3}}\right)} = \frac{\frac{-1+3}{\sqrt{3}}}{1+1} = \frac{\frac{2}{\sqrt{3}}}{2} = \frac{1}{\sqrt{3}}$$

$$\theta = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right) = 30^\circ$$

10

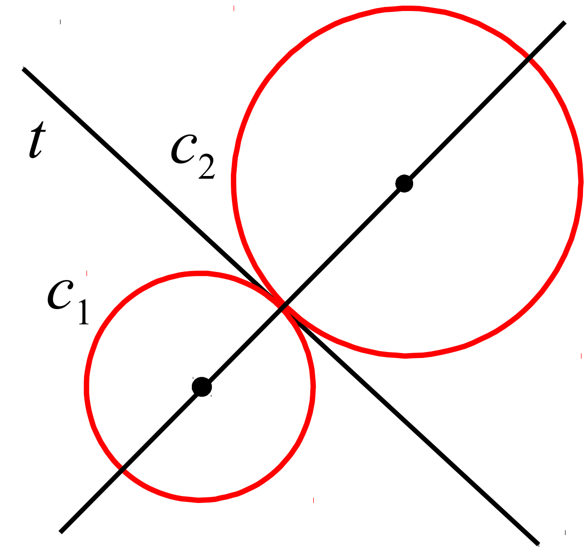
Páipéar 2 Ceist 4
2013

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Teagmhaíonn na ciorcail c_1 agus c_2 le chéile go seachtrach mar a thaispeántar.



$$(x + 3)^2 + (y + 2)^2 = 2^2$$

$$x^2 + 6x + 9 + y^2 + 4y + 4 = 4$$

$$x^2 + y^2 + 6x + 4y + 9 = 0$$

Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x - h)^2 + (y - k)^2 = r^2$

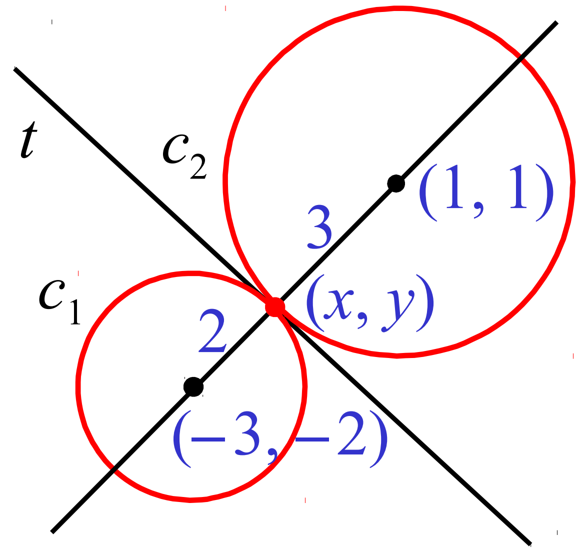
Ciorcal	Lár	Ga	Cothromóid
c_1	$(-3, -2)$	2	$x^2 + y^2 + 6x + 4y + 9 = 0$
c_2	$(1, 1)$	3	$x^2 + y^2 - 2x - 2y - 7 = 0$

10

$$x^2 + y^2 - 2x - 2y - 7 = 0$$

$$(x - 1)^2 + (y - 1)^2 = 3^2$$

Teagmhaíonn na ciorcail c_1 agus c_2 le chéile go seachtrach mar a thaispeántar.



(b) **(i)** Faigh comhordanáidí an phointe teagmhála ag c_1 agus c_2.

$$(x, y) = \left(\frac{bx_1 + ax_2}{b + a}, \frac{by_1 + ay_2}{b + a} \right)$$

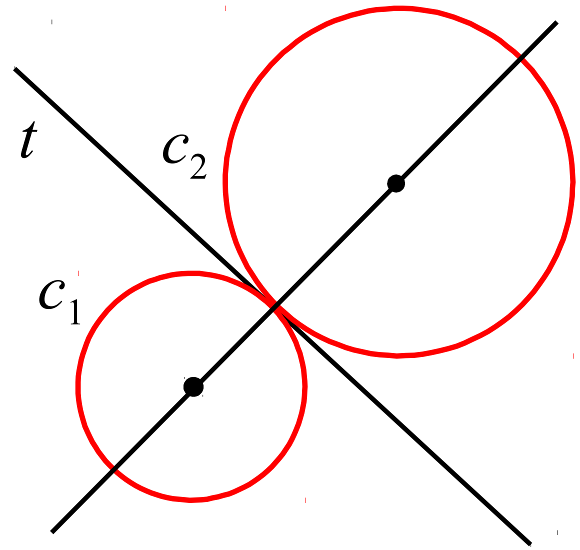
Ciorcal	Lár	Ga	Cothromóid
c_1	$(-3, -2)$	2	$x^2 + y^2 + 6x + 4y + 9 = 0$
c_2	$(1, 1)$	3	$x^2 + y^2 - 2x - 2y - 7 = 0$

$$(x, y) = \left(\frac{2(1) + 3(-3)}{2 + 3}, \frac{2(1) + 3(-2)}{2 + 3} \right) = \left(\frac{-7}{5}, \frac{-4}{5} \right)$$

10

Teagmhaíonn na ciorcail c_1 agus c_2 le chéile go seachtrach mar a thaispeántar.

(b) **(ii)** Uaidh sin, nó i slí eile, faigh cothromóid an tadhlaí, t, atá i gcomhpháirt ag c_1 agus c_2 .



Ciorcal	**Lár**	**Ga**	**Cothromóid**
c_1	$(-3, -2)$	2	$\cancel{x^2} + \cancel{y^2} + 6x + 4y + 9 = 0$
c_2	$(1, 1)$	3	$\cancel{x^2} + \cancel{y^2} - 2x - 2y - 7 = 0$

Dealaigh

$8x + 6y + 16 = 0$

$4x + 3y + 8 = 0$

5

Páipéar 2 Ceist 1
2012

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

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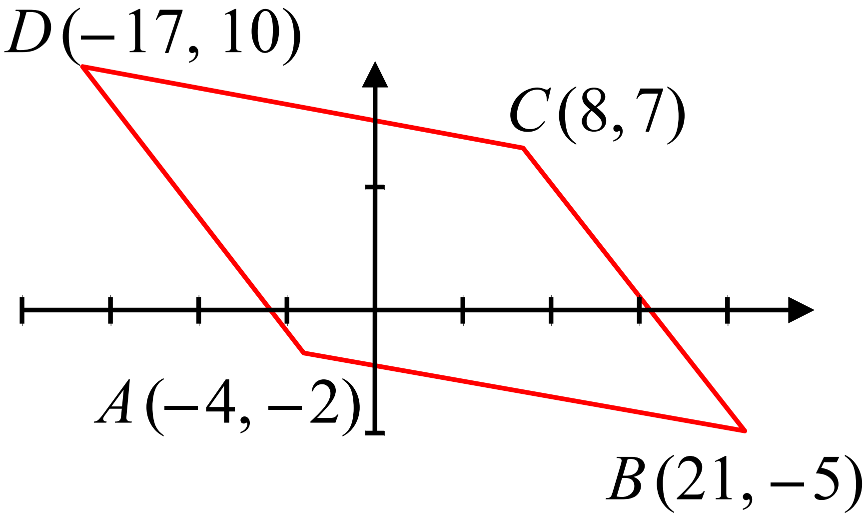
(a) Agus comhordanáidí stuaiceanna an cheathairshleasáin *ABCD* tugtha duit, déan cur síos ar **thrí** shlí dhifriúla chun a fháil amach, agus teicníochtaí na céimseatan comhordanáidí á n-úsáid agat, cé acu an comhthreomharán é an ceathairshleasán nó nach ea.

- Seicéail an bhfuil an fhána chéanna sa dá phéire de shleasa urchomhaireacha (foirmle fána). 5
- Seicéail an bhfuil an dá phéire de shleasa urchomhaireacha ar comhfhad (foirmle faid). 5
- Seiceáil an bhfuil lárphointí na dtrasnán i gcomhthráth (trasnáin ag déroinnt a chéile). 5
- Seiceáil an bhfuil an t-aistriú ó *A* go *B* mar a chéile leis an aistriú ó *D* go *C* (nó a chomhionann).
- Seiceáil an bhfuil an fhána chéanna sa dá phéire de shleasa urchomhaireacha agus go bhfuil siad ar comhfhad (foirmle fána agus faid).

(b) Bain úsáid as ceann **amháin** de na modhanna a luaigh tú agus faigh amach an comhthreomharán é an ceathairshleasán a bhfuil na stuaiceanna (–4, –2), (21, –5), (8, 7) agus (–17, 10) aige.



Fána $AB = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{-5-(-2)}{21-(-4)} = \dfrac{-3}{25}$

Fána $CD = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{7-10}{8-(-17)} = \dfrac{-3}{25}$

AB comhthreomhar le CD

Fána $AD = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{-2-10}{-4-(-17)} = \dfrac{-12}{13}$

Fána $BC = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{-5-7}{21-8} = \dfrac{-12}{13}$

AD comhthreomhar le BC

10

Is comhthreomharán é $ABCD$

Páipéar 2 Ceist 2
2012

25 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Is iad na cothromóidí atá ag dhá chiorcal ná:

Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x-h)^2 + (y-k)^2 = r^2$

$$x^2 + y^2 - 6x - 10y + 29 = 0$$

$$x^2 + y^2 - 2x - 2y - 43 = 0$$

(a) Scríobh síos lárphointe agus fad gha gach ciorcail díobh.

$$x^2 + y^2 - 6x - 10y + 29 = 0$$

$$(x-3)^2 + (y-5)^2 - 9 - 25 + 29 = 0$$

$$(x-3)^2 + (y-5)^2 = 5$$

Lár = (3, 5) Ga = $\sqrt{5}$

5

$$x^2 + y^2 - 2x - 2y - 43 = 0$$

$$(x-1)^2 + (y-1)^2 - 1 - 1 - 43 = 0$$

$$(x-1)^2 + (y-1)^2 = 45$$

Lár = (1, 1) Ga = $3\sqrt{5}$

5

Is iad na cothromóidí atá ag dhá chiorcal ná:

Lár = (3, 5) Ga = $\sqrt{5}$ $x^2 + y^2 - 6x - 10y + 29 = 0$

Lár = (1, 1) Ga = $3\sqrt{5}$ $x^2 + y^2 - 2x - 2y - 43 = 0$

(b) Cruthaigh go bhfuil na ciorcail ag teagmháil lena chéile.

An fad idir na lárphointí $= \sqrt{(3-1)^2 + (5-1)^2}$

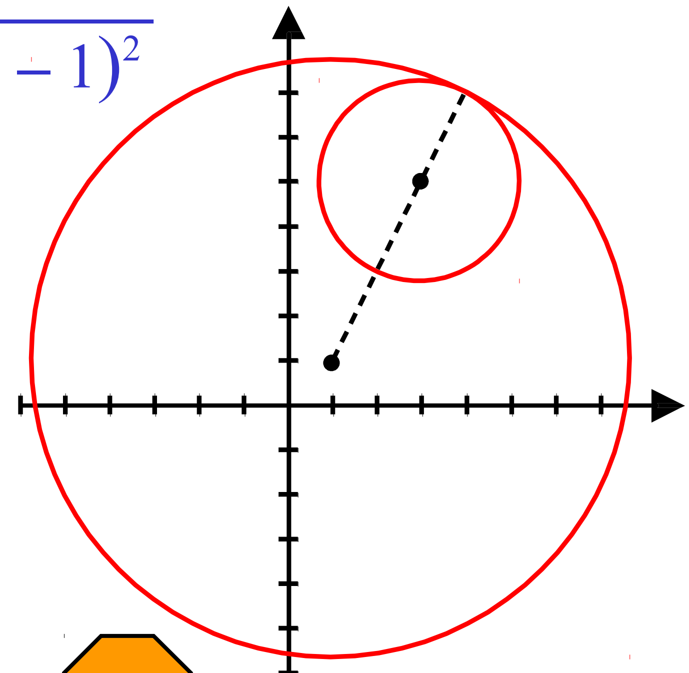
$= \sqrt{2^2 + 4^2}$

$= 2\sqrt{5}$

Difríocht an dá gha $= 3\sqrt{5} - \sqrt{5}$

$= 2\sqrt{5}$

Tadhlaíonn na ciorcail lena chéile (inmhéanach)



Fad $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

5

Is iad na cothromóidí atá ag dhá chiorcal ná:

Lár = (3, 5) Ga = $\sqrt{5}$ $x^2 + y^2 - 6x - 10y + 29 = 0$

Lár = (1, 1) Ga = $3\sqrt{5}$ $x^2 + y^2 - 2x - 2y - 43 = 0$

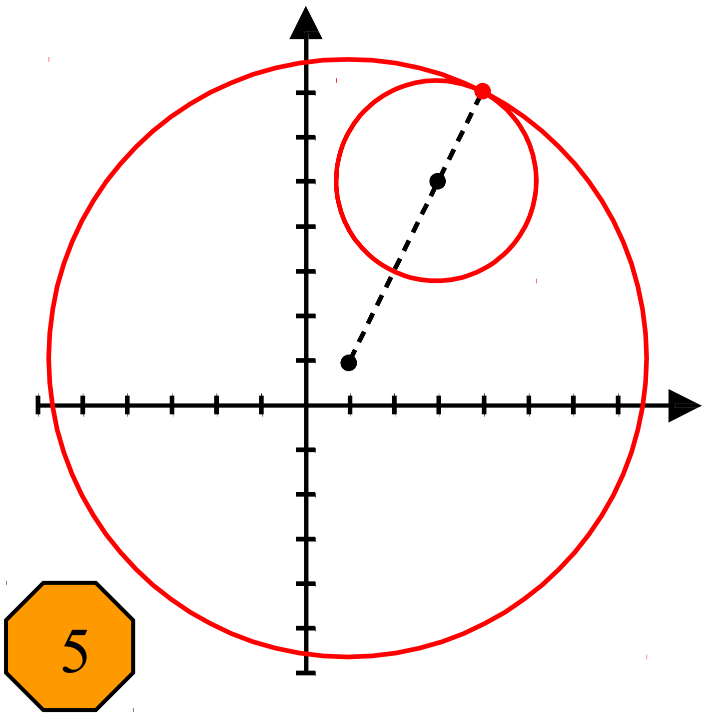
(c) Fíoraigh gurb é (4, 7) an pointe atá i gcomhpháirt acu.

$$x^2 + y^2 - 6x - 10y + 29 = 0$$

$$4^2 + 7^2 - 6(4) - 10(7) + 29 = 0$$

$$16 + 49 - 24 - 70 + 29 = 0$$

$$94 - 94 = 0$$



$$x^2 + y^2 - 2x - 2y - 43 = 0$$

$$4^2 + 7^2 - 2(4) - 2(7) - 43 = 0$$

$$16 + 49 - 8 - 14 - 43 = 0$$

$$65 - 65 = 0$$

$\therefore$ (4, 7) comónta

Is iad na cothromóidí atá ag dhá chiorcal ná:

Lár = (3, 5) Ga = $\sqrt{5}$ $x^2 + y^2 - 6x - 10y + 29 = 0$

Lár = (1, 1) Ga = $3\sqrt{5}$ $x^2 + y^2 - 2x - 2y - 43 = 0$

(d) Faigh cothromóid an chomhthadhlaí.

$$\cancel{x^2} + \cancel{y^2} - 6x - 10y + 29 = 0$$

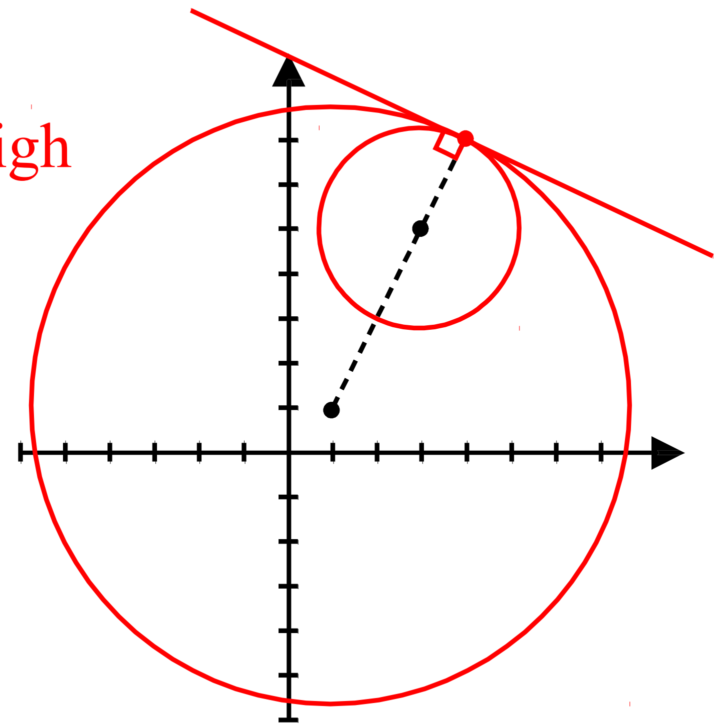
$$\cancel{x^2} + \cancel{y^2} - 2x - 2y - 43 = 0$$

Dealaigh

$$-4x - 8y + 72 = 0$$

Roinn ar -4 $x + 2y - 18 = 0$

5



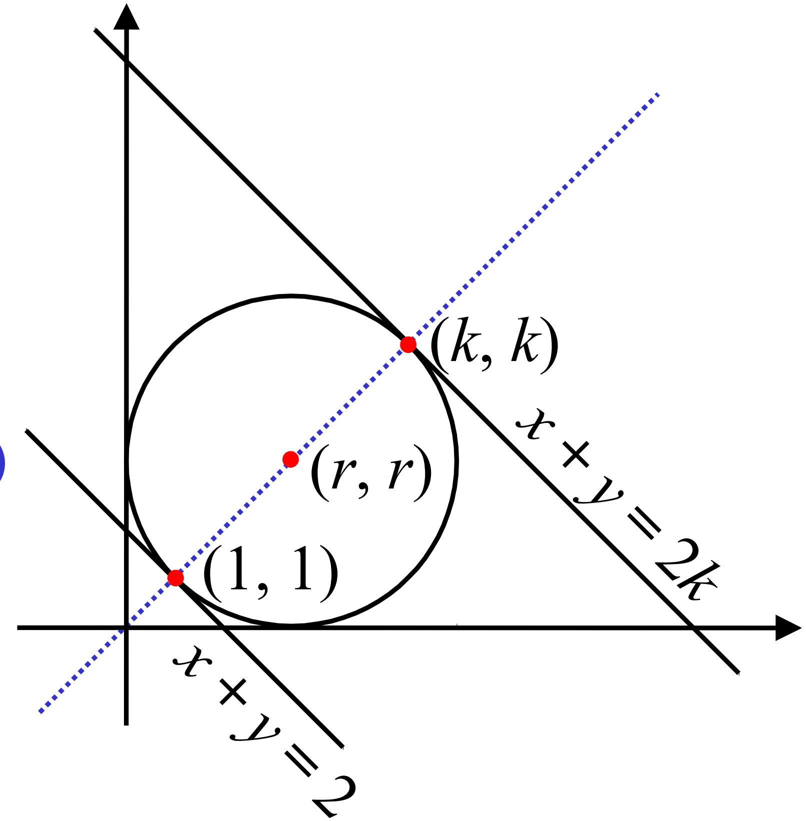
Páipéar 2 Ceist 3
2012

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Is tadhlaithe leis an gciorcal a thaispéantar sa learáid an x-ais, an y-ais, an líne $x + y = 2$ agus an líne $x + y = 2k$, áit a bhfuil $k > 1$.
Faigh luach k.



Má tadhlaíonn an ciorcal an x-ais agus an y-ais, tá na haiseanna seo ar comhfhad ó lár an chiorcail. Ciallíonn sé seo go bhfuil an lárphointe ar an líne $x = y$.

(r, r) is é an lárphointe idir $(1, 1)$ agus (k, k)

$$r = \frac{k+1}{2} \Rightarrow k = 2r - 1$$
$$= 2(2 \pm \sqrt{2}) - 1$$
$$= 3 \pm 2\sqrt{2}$$

25

Is ionann an fad ingearach go $x + y = 2$ agus an ga, r.

$$x + y - 2 = 0$$

$$\text{Fad Ingearach} = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}} \Rightarrow \frac{|r + r - 2|}{\sqrt{1^2 + 1^2}} = \frac{|2r - 2|}{\sqrt{2}} = r$$

$$\Rightarrow 2r - 2 = \pm r\sqrt{2} \Rightarrow 2r \mp r\sqrt{2} = 2$$

$$\Rightarrow r = \frac{2}{2 \mp \sqrt{2}} = 2 \pm \sqrt{2}$$

Páipéar 2 Ceist 3
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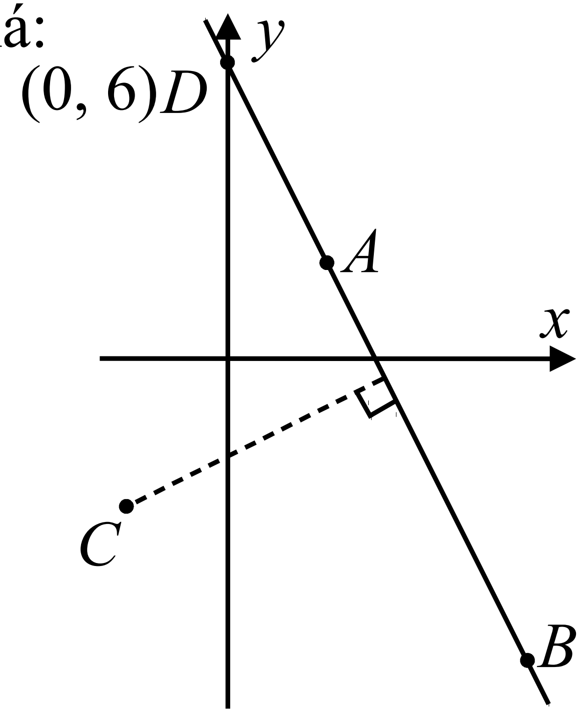
An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Is iad comhordanáidí trí pointí A, B, and C ná:

$A\,(2, 2)$, $B\,(6, -6)$, $C\,(-2, -3)$.

(x_1, y_1) (x_2, y_2)



(a) Faigh cothromóid AB.

$$\text{Fána } AB = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6-2}{6-2} = \frac{-8}{4} = -2$$

Cothromóid Líne: $y - y_1 = m\,(x - x_1)$

$$y - 2 = -2(x - 2)$$

$$y - 2 = -2x + 4$$

$$2x + y - 6 = 0$$

5

(b) Déroineann an líne AB an y-ais ag D. Faigh comhordanáidí D.

Chun an y-idirlíne a fháil, cur $x = 0$.

$$2(0) + y - 6 = 0$$

$$y = 6 \Rightarrow D = (0, 6)$$

5

Is iad comhordanáidí trí pointí A, B, and C ná:

$A(2, 2)$, $B(6, -6)$, $C(-2, -3)$.

(x_1, y_1)

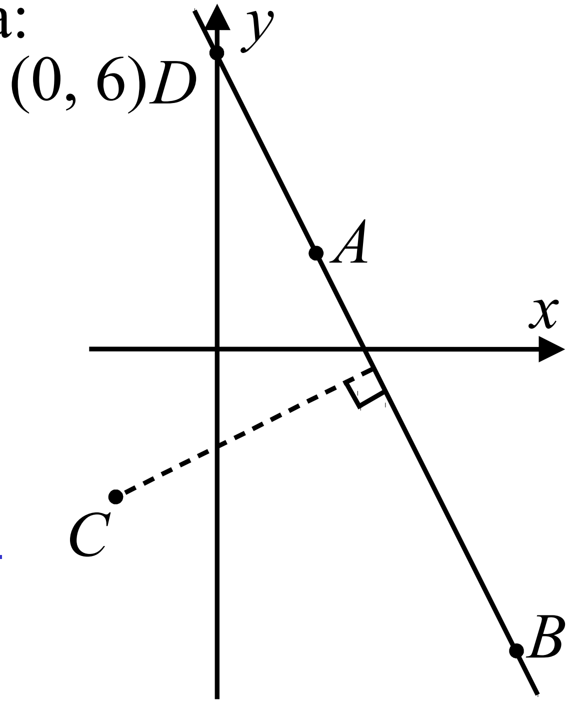
(c) Faigh an fad ingearach ó C go AB.

$$\text{Fad Ingearach} = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

$$= \frac{|2(-2) + 1(-3) - 6|}{\sqrt{2^2 + 1^2}}$$

$$= \frac{|-13|}{\sqrt{5}} = \frac{13}{\sqrt{5}}$$

5

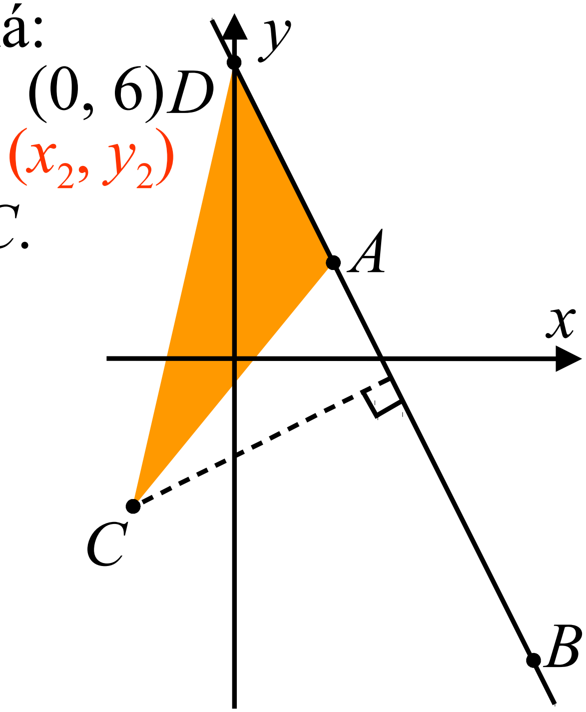


$2x + y - 6 = 0$

Is iad comhordanáidí trí pointí A, B, and C ná:

$A(2, 2)$, $B(6, -6)$, $C(-2, -3)$.

(x_1, y_1)



(d) Uaidh sin, faigh achar an triantán ADC.

$$\text{Fad Ingearach} = \frac{13}{\sqrt{5}}$$

$$\text{Fad} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$|AD| = \sqrt{(0-2)^2 + (6-2)^2}$$

$$= \sqrt{(-2)^2 + 4^2}$$

$$= 2\sqrt{5}$$

10

$$\text{Achar triantáin} = \frac{1}{2}bh$$

$$\text{Achar } ADC = \frac{1}{\cancel{2}} \times \cancel{2}\cancel{\sqrt{5}} \times \frac{13}{\cancel{\sqrt{5}}}$$

$$= 13 \text{ aonad}^2$$

Páipéar 2 Ceist 4
2012 Sampla SEC

25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

www.mathsplus.ie

(a) Scríobh síos cothromóid an ciorcail a bhfuil lár $(-3, 2)$ agus ga 4 aici.

Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x-h)^2 + (y-k)^2 = r^2$

5

$$(x+3)^2 + (y-2)^2 = 16$$

$$x^2 + y^2 + 6x - 4y - 9 - 4 - 16 = 0$$

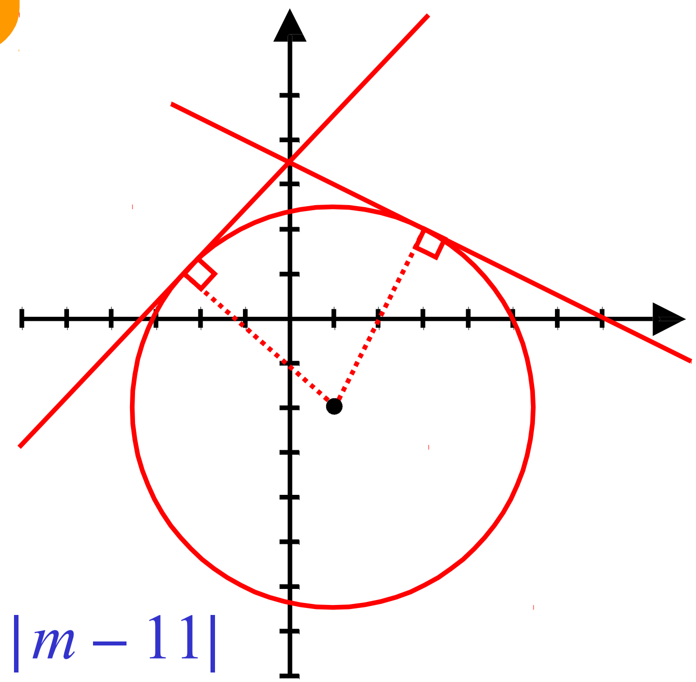
$$x^2 + y^2 + 6x - 4y - 29 = 0$$

(b)

Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x-h)^2 + (y-k)^2 = r^2$

$2x + 4y - 15 = 0.$

$- 2y - 7 = 0$ mar thadhlaí



$$(x-1)^2 + (y+2)^2 - 1 - 4 - 15 = 0$$

$$(x-1)^2 + (y+2)^2 = 20$$

Lár $= (1, -2)$ Ga $= 2\sqrt{5}$

(x_1, y_1)

$$\text{Fad Ingearach} = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

$$2\sqrt{5} = \frac{|m(1) + 2(-2) - 7|}{\sqrt{m^2 + 2^2}} \Rightarrow 2\sqrt{5} = \frac{|m - 11|}{\sqrt{m^2 + 4}}$$

$$\Rightarrow 2\sqrt{5}\sqrt{m^2 + 4} = |m - 11| \Rightarrow 20(m^2 + 4) = (m - 11)^2$$

Cearnaigh an dá thaobh

Tá an fad ingearach go $mx + 2y - 7 = 0$ cothrom leis an nga.

(b) Is é cothromóid ciorcal ná $x^2 + y^2 - 2x + 4y - 15 = 0$.
Faigh luachanna m agus an ... $7 = 0$ mar tadhlaí leis an gciorcal.

Is uimhreacha príomha iad 19 agus 41.

$$20(m^2 + 4) = (m - 11)^2$$

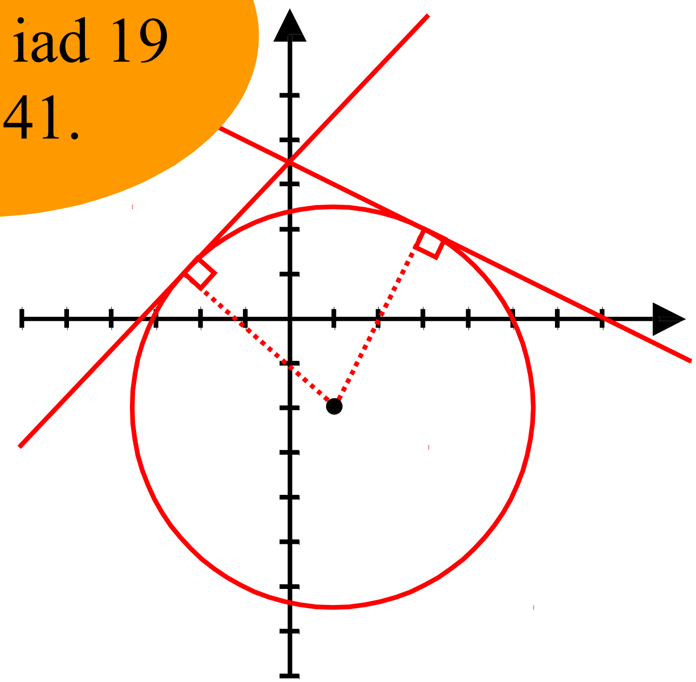
$$20m^2 + 80 = m^2 - 22m + 121$$

$$19m^2 + 22m - 41 = 0$$

$$(19m + 41)(m - 1) = 0$$

$$\Rightarrow m = \frac{-41}{19} \text{ or } m = 1$$

20



Páipéar 2 Ceist 3
2011

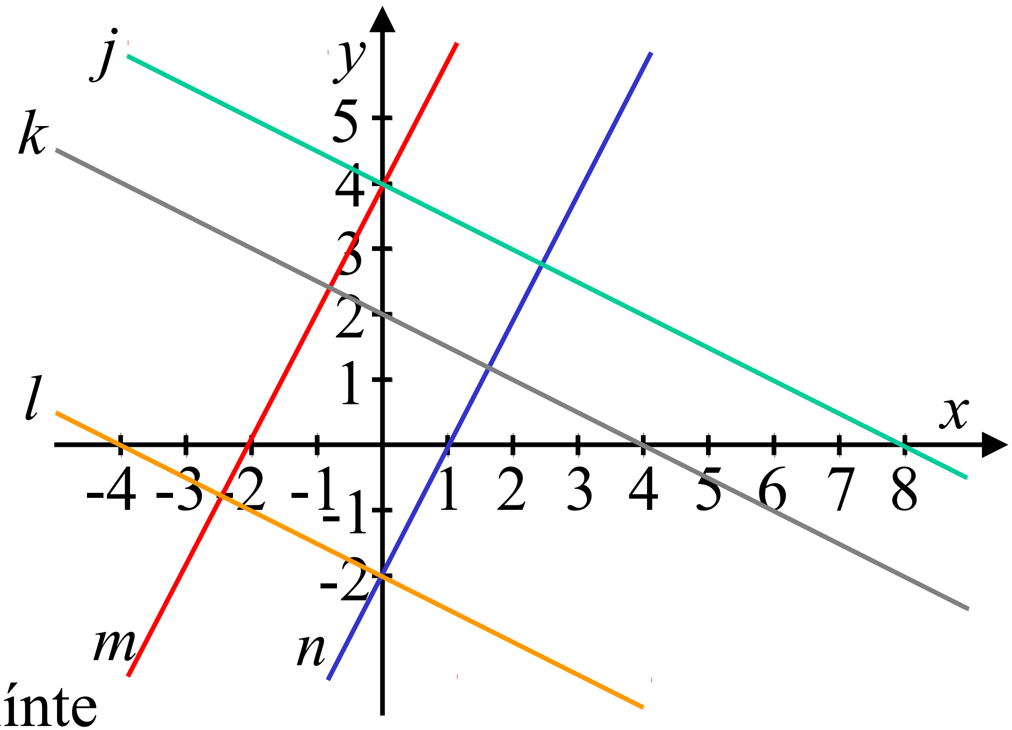
25 marc

$a^2+2ab+b^2=(a+b)^2$

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Sa léaráid chomhordanáideach a thaispeántar, tá na línte j, k, agus l comhthreomhar le chéile, mar atá na línte m agus n freisin. Sa tábla thíos tugtar cothromóidí ceithre cinn de na cúig líne.

Cothromóid	Líne
$x + 2y = -4$ $y = -\frac{1}{2}x - 2$	l
$2x - y = -4$ $y = 2x + 4$	m
$x + 2y = 8$ $y = -\frac{1}{2}x + 4$	j
$2x - y = 2$ $y = 2x - 2$	n



(a) Agus ceithre cinn de na línte á meaitseáil lena gcothromóidí agat, comhlánaigh an tábla.

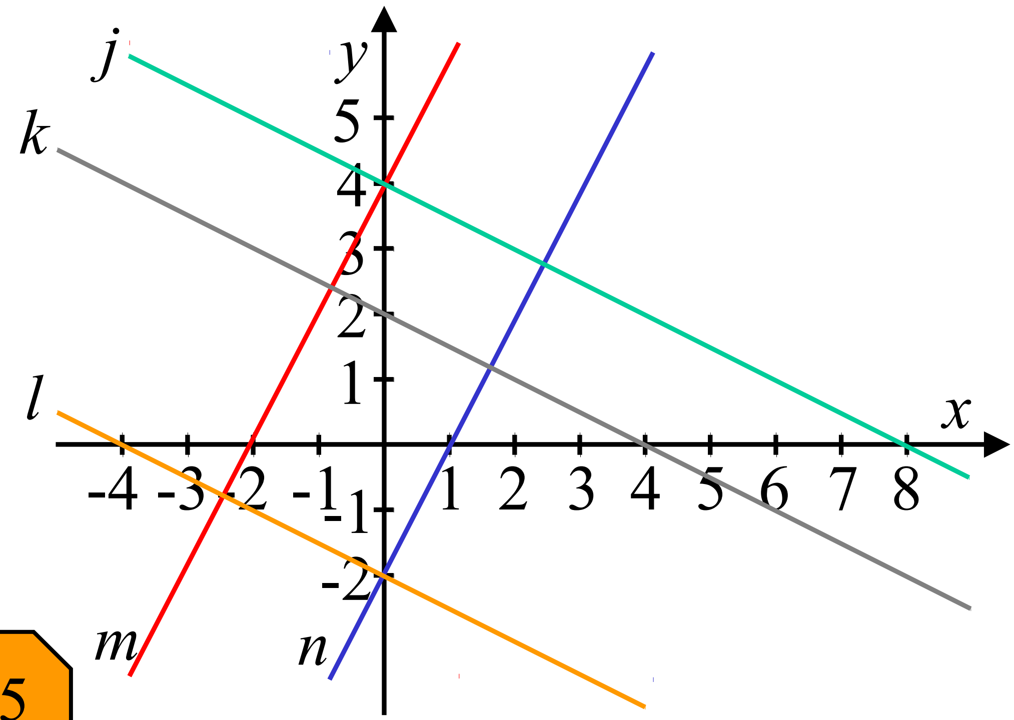
(b) Uaidh sin, cuir isteach scálaí ar an x-ais agus ar an y-ais.

15

5

Sa léaráid chomhordanáideach a thaispeántar, tá na línte j, k, agus l comhthreomhar le chéile, mar atá na línte m agus n freisin. Sa tábla thíos tugtar cothromóidí ceithre cinn de na cúig líne.

Cothromóid	Líne
$y = -\frac{1}{2}x - 2$	l
$y = 2x + 4$	m
$y = -\frac{1}{2}x + 4$	j
$y = 2x - 2$	n



$y = -\frac{1}{2}x + 2 \Rightarrow x + 2y = 4$

5

(c) Uaidh sin, faigh cothromóid na líne atá fágtha, má thugtar gur slánuimhreacha iad araon a x-idirlíne agus a y-idirlíne.

Páipéar 2 Ceist 5
2011

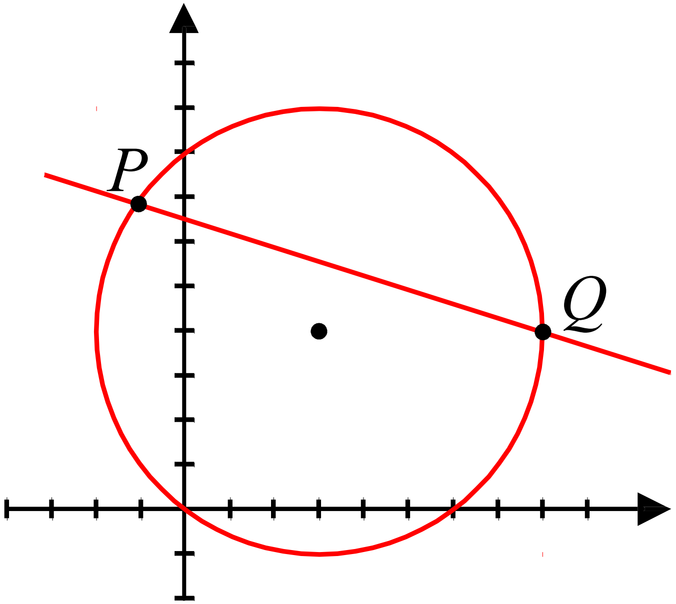
25 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

Trasnaíonn an líne $x + 3y = 20$ an ciorcal $x^2 + y^2 - 6x - 8y = 0$ ag na pointí P agus Q.
Faigh cothromóid an chiorcail a bhfuil $[PQ]$ mar thrastomhas aige.

$x + 3y = 20 \Rightarrow x = 20 - 3y$

Cuir an luach seo in áit x i gcothromóid an chiorcail



$$x^2 + y^2 - 6x - 8y = 0$$

$$(20 - 3y)^2 + y^2 - 6(20 - 3y) - 8y = 0$$

$$400 - 120y + 9y^2 + y^2 - 120 + 18y - 8y = 0$$

$$10y^2 - 110y + 280 = 0$$

$$y^2 - 11y + 28 = 0$$

$$(y - 4)(y - 7) = 0$$

$$y = 4 \text{ or } y = 7$$

Nuair atá $y = 4 \Rightarrow x = 20 - 3(4) = 8$

Nuair atá $y = 7 \Rightarrow x = 20 - 3(7) = -1$

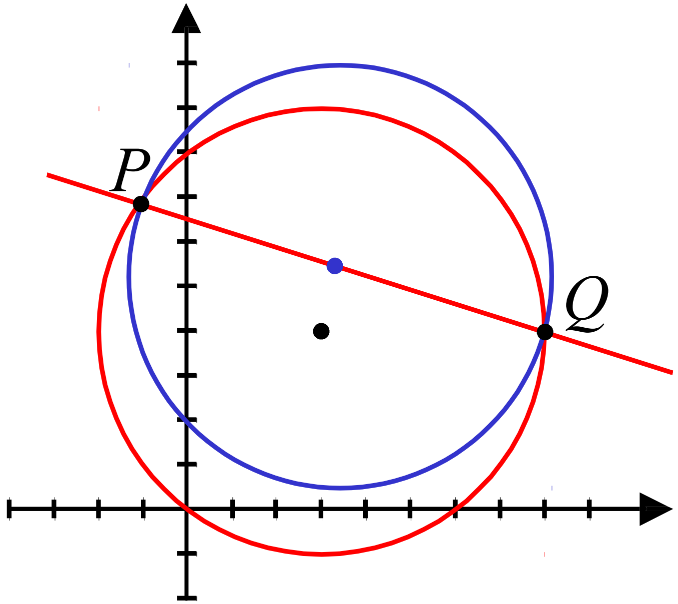
Trasnaíonn an líne $x + 3y = 20$ an ciorcal $x^2 + y^2 - 6x - 8y = 0$ ag na pointí P agus Q.
Faigh cothromóid an chiorcail a bhfuil $[PQ]$ mar thrastomhas aige.

Is iad $P(-1, 7)$ agus $Q(8, 4)$ pointí deireadh an trastomhais

$$\text{Lárphointe } PQ = \left(\frac{-1+8}{2}, \frac{7+4}{2}\right)$$

$$= (3{\cdot}5, 5{\cdot}5)$$

25



$$\text{Ga} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(8 - 3{\cdot}5)^2 + (4 - 5{\cdot}5)^2}$$

$$= \sqrt{4{\cdot}5^2 + (-1{\cdot}5)^2}$$

$$= \frac{3\sqrt{10}}{2}$$

$$(x - 3{\cdot}5)^2 + (y - 5{\cdot}5)^2 = 22{\cdot}5$$

Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x - h)^2 + (y - k)^2 = r^2$

Páipéar 2 Ceist 4
2010

25 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

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(a) Tá lárphointe ciorcail ar an líne $x - 2y - 1 = 0$. Is tadhlaithe leis an gciorcal iad an x-ais agus an líne $y = 6$.
Faigh cothromóid an chiorcail seo.

Ga = 3

Cuir $(h, 3)$ in áit y i gcothromóid an líne

$$h - 2(3) - 1 = 0$$

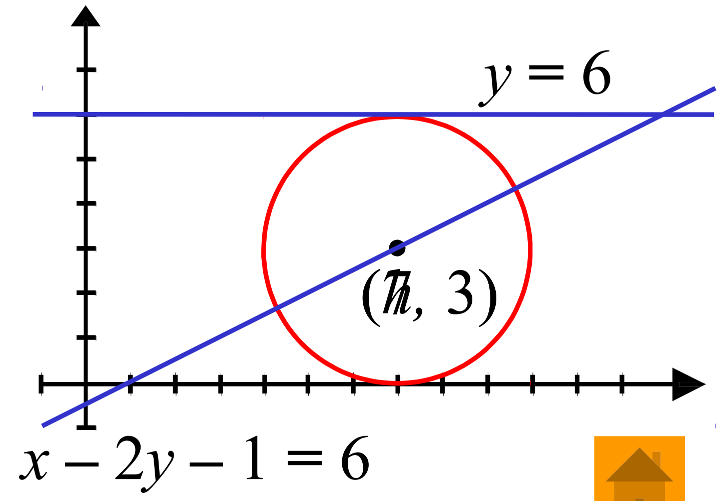
$$h - 6 - 1 = 0$$

$$h = 7$$

Lár $(7, 3)$

$$(x - 7)^2 + (y - 3)^2 = 9$$

15



Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x - h)^2 + (y - k)^2 = r^2$

(a) Tá lárphointe ciorcal ar an líne $x - 2y - 1 = 0$. Is tadhlaithe leis an gciorcal iad an x-ais agus an líne $y = 6$.
Faigh cothromóid an chiorcail seo.

(b) Tá an chothromóid $x^2 + y^2 - 6x - 12y + 41 = 0$ ag ciorcal difriúil. Taispeáin go dtadhlaíonn an ciorcal seo agus an ciorcal i gcuid **(a)** lena chéile go seachtrach.

$(x - 3)^2 + (y - 6)^2 = 9 - 36 + 41 = 4$

Lár $= (3, 6)$ Ga $= 2$

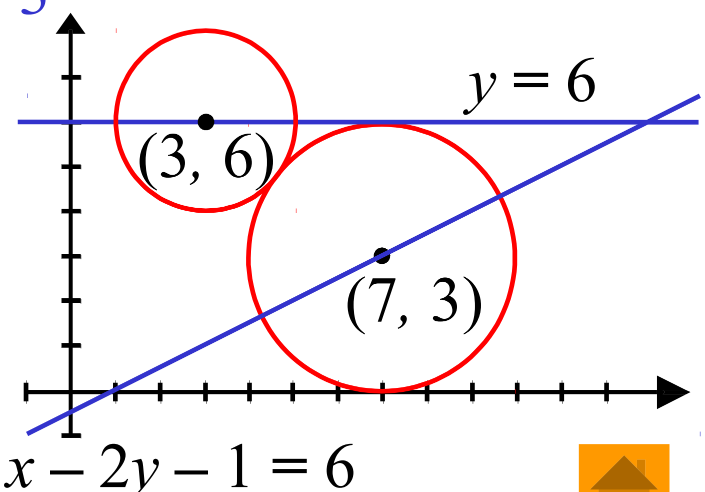
An fad idir na lárphointí $= \sqrt{(3 - 7)^2 + (6 - 3)^2}$

$= \sqrt{(-4)^2 + 3^2}$

$= 5$

Difríocht an dhá gha $= 2 + 3 = 5$

$\therefore$ Tadhlaíonn na ciorcail lena chéile (seachtrach)



Cothromóid an chiorcail ar lárphointe dó (h, k) agus ar ga dó r ná: $(x - h)^2 + (y - k)^2 = r^2$

10

Páipéar 2 Ceist 6
2010

15 marc

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta

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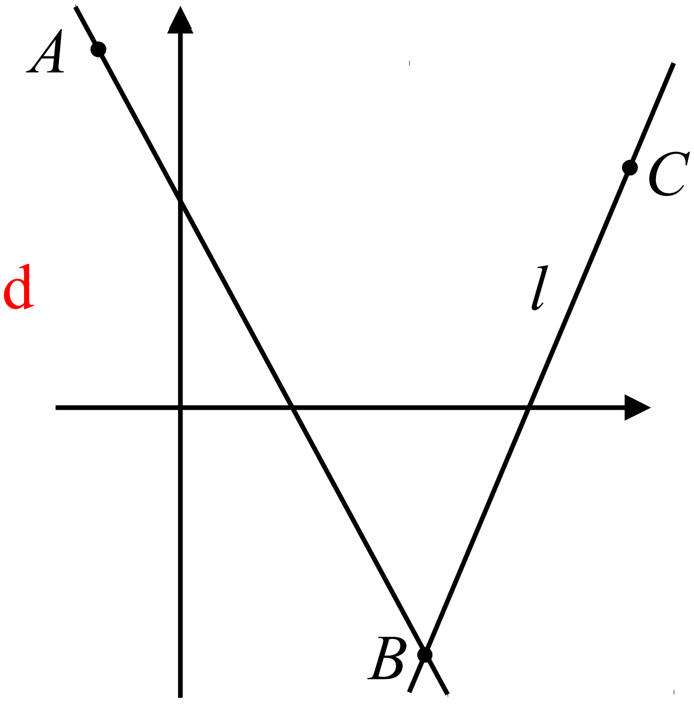
Is iad seo a leanas comhordanáidí na dtrí phointe A, B agus C: $A(-2,9)$, $B(6,-6)$ agus $C(11,6)$. Gabhann an líne l trí B agus tá an chothromóid $12x - 5y - 102 = 0$ aici.



(a) Fíoraigh go bhfuil C ar l.

Cuir na luachanna thuas sa cothromóid

$$12(11) - 5(6) - 102 = 0$$

$$132 - 30 - 102 = 0$$

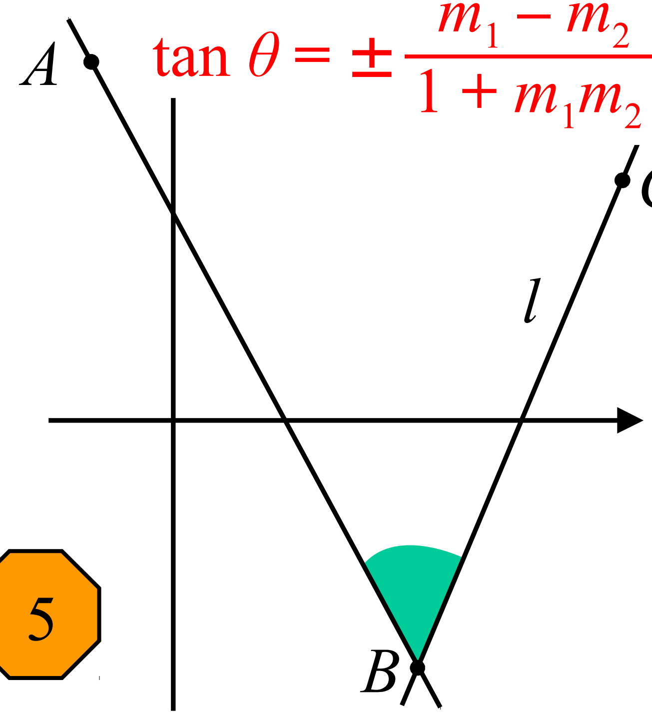
$$132 - 132 = 0$$

$\therefore C(11, 6)$ ar an líne

5

Is iad seo a leanas comhordanáidí na dtrí phointe A, B agus C: $A(-2,9)$, $B(6,-6)$ agus $C(11,6)$. Gabhann an líne l trí B agus tá an chothromóid $12x - 5y - 102 = 0$ aici.

$$\tan\theta = \pm\frac{m_1 - m_2}{1 + m_1 m_2}$$



(b) Faigh fána AB, agus uaidh sin faigh tan ($\angle ABC$), mar chodán.

(x_1, y_1) (x_2, y_2)

$A(-2, 9)$, $B(6, -6)$, $C(11, 6)$

$$\text{Fána } AB = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - 9}{6 - (-2)} = \frac{-15}{8} \quad m_1$$

5

$$\text{Fána } BC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-6)}{11 - 6} = \frac{12}{5} \quad m_2$$

$$\angle ABC < 90^\circ$$

$$\tan\angle ABC = \pm\frac{\frac{-15}{8} - \frac{12}{5}}{1 + \left(\frac{-15}{8}\right)\left(\frac{12}{5}\right)} = \pm\frac{171}{140}$$

5