

ҰБТ есептерін шығарудың тиімді тәсілдері



1 Радикалдар

2 Өрнектер

3 Тригонометрия

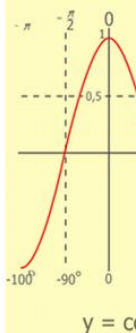
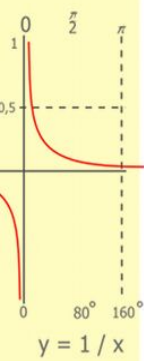
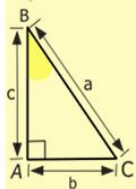
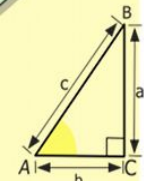
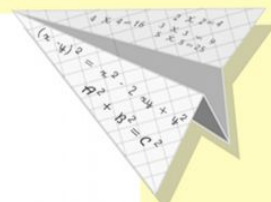
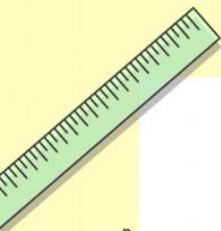
4 Жазық фигура

Мақсаты:

ҰБТ есептерін шығаруда
тиімді әдістерін үйрету



Радикалы бар сандык өрнектерді түрлендіру



$$\sqrt{a + \sqrt{e}} = \sqrt{\frac{a + \sqrt{a^2 - e}}{2}} + \sqrt{\frac{a - \sqrt{a^2 - e}}{2}}$$

$$\sqrt{a - \sqrt{e}} = \sqrt{\frac{a + \sqrt{a^2 - e}}{2}} - \sqrt{\frac{a - \sqrt{a^2 - e}}{2}}$$

$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$

- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
- 5 x 5 = 25
- 6 x 6 = 36
- 7 x 7 = 49
- 8 x 8 = 64
- 9 x 9 = 81



$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

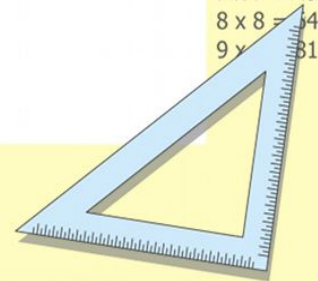
$$\sin 90^\circ = 1$$

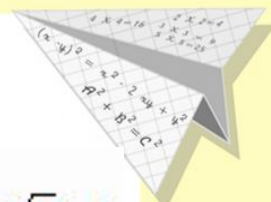
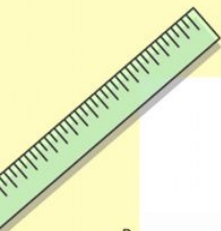


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

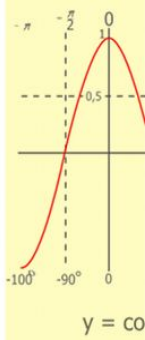
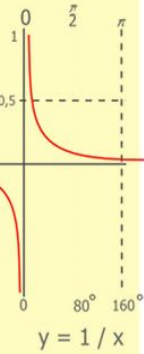
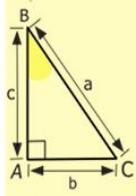
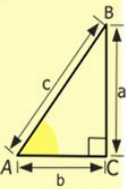
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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





$$\sqrt{25 + 4\sqrt{6}} = \sqrt{25 + \sqrt{96}} = \sqrt{\frac{25 + \sqrt{625 - 96}}{2}} + \sqrt{\frac{25 - \sqrt{625 - 96}}{2}} = \sqrt{\frac{25 + 23}{2}} + \sqrt{\frac{25 - 23}{2}} = 2\sqrt{6} + 1;$$



$$\begin{aligned} \sqrt{5 + 2\sqrt{6}} &= \sqrt{5 + \sqrt{24}} \\ &= \sqrt{\frac{5 + \sqrt{25 - 24}}{2}} + \sqrt{\frac{5 - \sqrt{25 - 24}}{2}} \\ &= \sqrt{\frac{5 + 1}{2}} + \sqrt{\frac{5 - 1}{2}} \\ &= \sqrt{3} + \sqrt{2} \end{aligned}$$

$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$

- $2 \times 2 = 4$
- $3 \times 3 = 9$
- $4 \times 4 = 16$
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- $7 \times 7 = 49$
- $8 \times 8 = 64$
- $9 \times 9 = 81$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

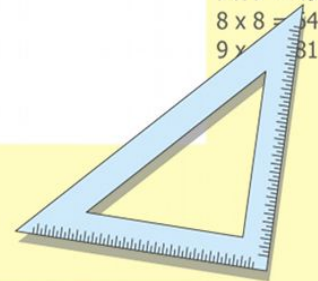
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$$(x+y)(x-y) = x^2 - y^2$$



Тийімді тәсілі:

$$1. \sqrt{25 + 4\sqrt{6}}$$

$2\sqrt{6}$ 2-ге бөлеміз

$$\left. \begin{aligned} (2 + \sqrt{6}) &= 10 \\ (1 + 2\sqrt{6}) &= 25 \\ (2\sqrt{3} + \sqrt{2}) &= 14 \\ (2\sqrt{2} + \sqrt{3}) &= 11 \end{aligned} \right\}$$

1. Жіктейміз
2. Квадраттап қосқанда берілген есептегі 25 шығу керек

$$2. \sqrt{5 + 2\sqrt{6}}$$

$$\left. \begin{aligned} (1 + \sqrt{6}) &= 7 \\ (\sqrt{2} + \sqrt{3}) &= 5 \end{aligned} \right\}$$

$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

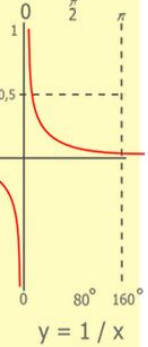
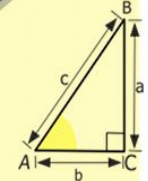
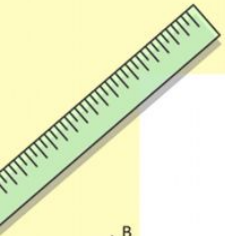
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

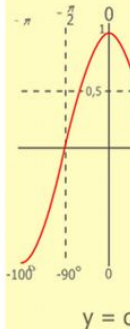
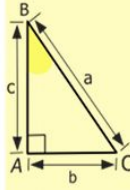
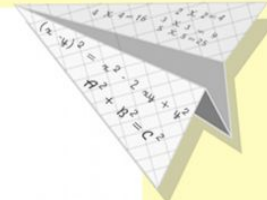
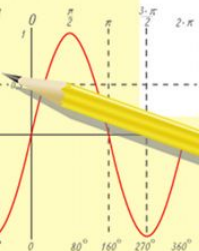
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

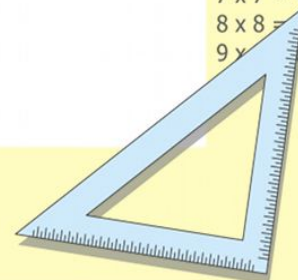
$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{r} \frac{1}{2} 500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



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Алгебралық өрнектерді ықшамдау

$$\frac{a-b+1}{a^2-ab} + \frac{a+b}{2ab} \left(\frac{a}{b^2-ab} + \frac{a}{b^2+ab} \right).$$

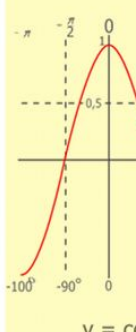
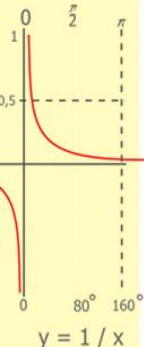
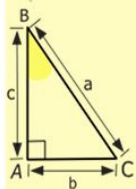
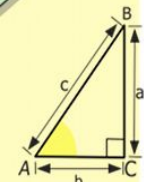
A) $\frac{b+1}{ab}$

B) $\frac{b-1}{2ab}$

C) $\frac{b-1}{ab}$

D) $\frac{1}{a}$

E) $\frac{1-a}{ab}$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 2100 \\ + 840 \\ \hline 105000 \end{array}$$

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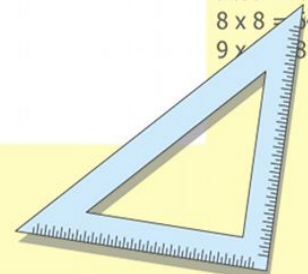
$\sin 90^\circ = 1$



$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

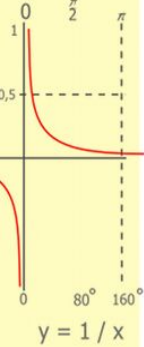
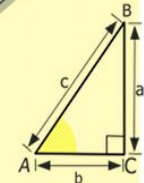
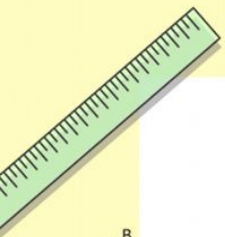
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$(x+y)(x-y) = x^2 - y^2$

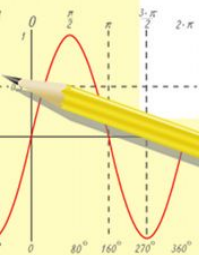


ШЫҒАРУ ЖОЛЫ:

$$\begin{aligned}
 & \frac{a-b+1}{a^2-ab} + \frac{a+b}{2ab} \left(\frac{a}{b^2-ab} + \frac{a}{b^2+ab} \right) = \\
 & = \frac{a-b+1}{a(a-b)} + \frac{a+b}{2ab} \cdot \frac{a}{b} \cdot \left(\frac{1}{b-a} + \frac{1}{b+a} \right) = \\
 & = \frac{a-b+1}{a(a-b)} + \frac{a+b}{2b^2} \cdot \left(\frac{a+b+b-a}{(b-a)(b+a)} \right) = \\
 & = \frac{a-b+1}{a(a-b)} + \frac{(a+b) \cdot 2b}{2b^2(b-a)(b+a)} =
 \end{aligned}$$



$$\begin{array}{r}
 2500 \\
 \times 42 \\
 \hline
 210 \\
 + 84 \\
 \hline
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 \end{array}$$



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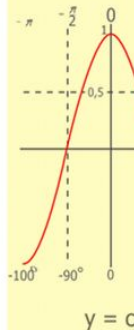
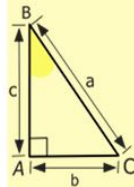
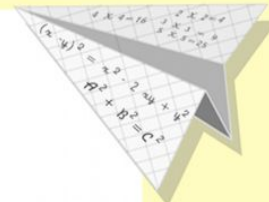


$$\begin{cases}
 y = \sin 90 \\
 x = 25y + 45
 \end{cases}$$

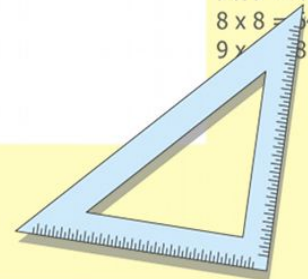
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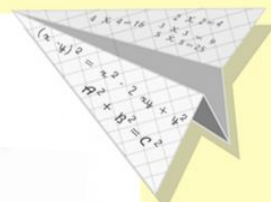
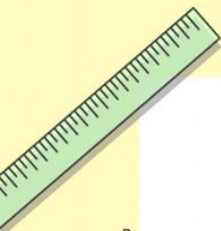
$$x = 70$$

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

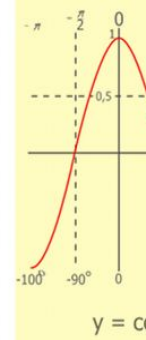
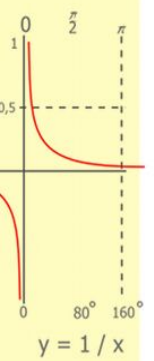
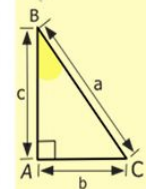
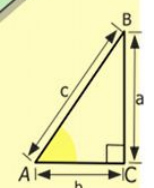


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$$\begin{aligned}
 &= \frac{a-b+1}{a(a-b)} - \frac{1}{b(a-b)} = \frac{(a-b+1)b-a}{ab(a-b)} = \\
 &= \frac{ab-b^2+b-a}{ab(a-b)} = \frac{b(a-b)-(a-b)}{ab(a-b)} = \\
 &= \frac{(a-b)(b-1)}{ab(a-b)} = \frac{b-1}{ab}
 \end{aligned}$$



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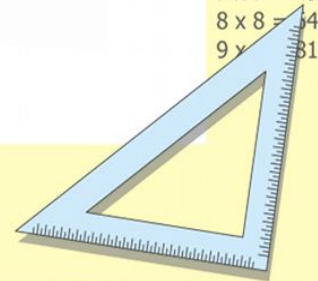
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Тиімді тәсілі:

Өзіміз кез келген мәнді аламыз.

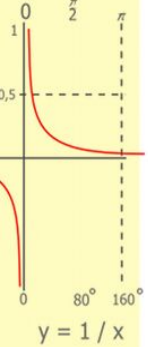
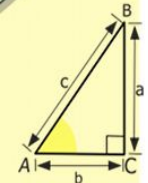
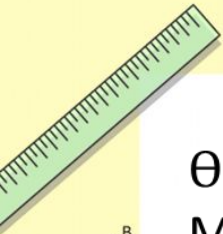
Мысалға: $a = 3, b = 2$

Берілген есепке орнына қоямыз

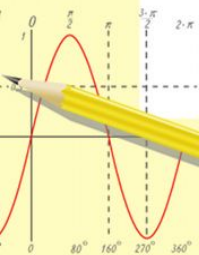
$$\frac{2}{3} + \frac{5}{12} * \left(\frac{3}{-2} + \frac{3}{10} \right) = \frac{2}{3} + \frac{5}{12} * -\frac{12}{10} = \frac{1}{6}$$

Жауаптарына өзіміз тандаган мәндерді қоямыз.

- A) $\frac{3}{6}$ B) $\frac{1}{12}$ C) $\frac{1}{6}$



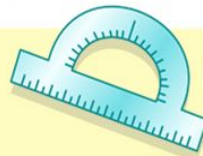
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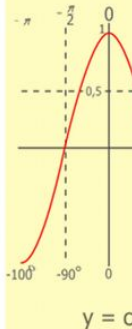
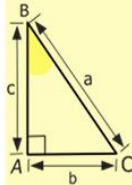
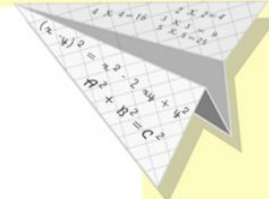
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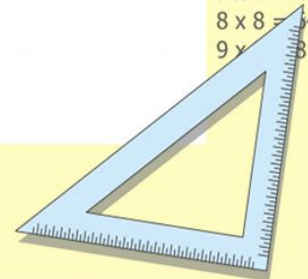
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$$y = \cos$$

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Мәтінді есептерді шығару

Жолдары

Құрамында никельдің мөлшері 5% және 40% болатын екі түрлі сорты бар. Құрамындағы никельдің мөлшері 30% болатын 140 тонна болат алу үшін екі сорттың әрқайсысынан неше тоннадан алу керек?

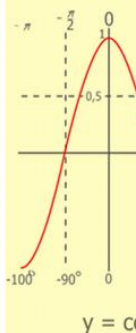
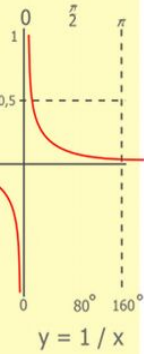
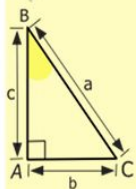
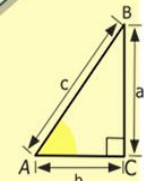
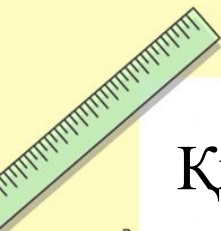
$$x_T \text{ ---- } 5\% \text{ ---- } 0,05$$

$$y_T \text{ ---- } 40\% \text{ ---- } 0,4$$

$$140 \text{ T ---- } 30\% \text{ ---- } 0,3$$

$$\begin{cases} x + y = 140 \\ 0,05x + 0,4y = 140 * 0,3 \end{cases}$$

Жауабы: 100 т, 40 т



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$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

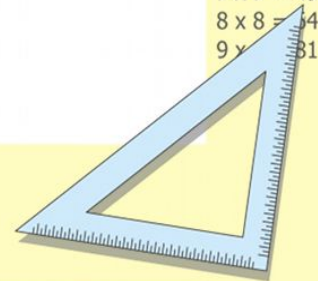
$$\sin 90^\circ = 1$$



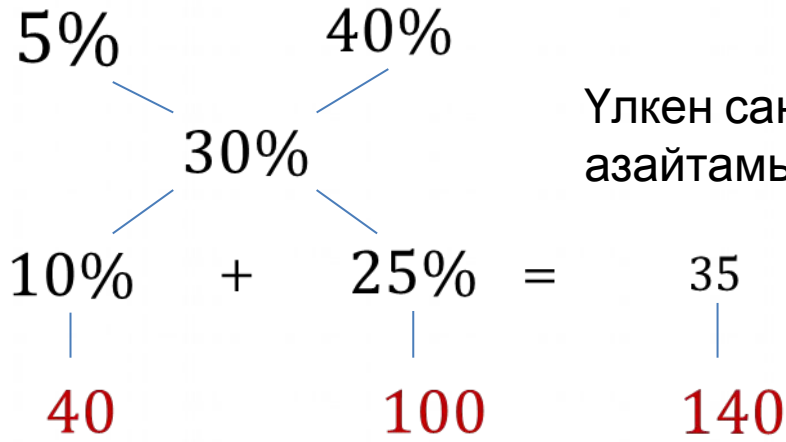
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

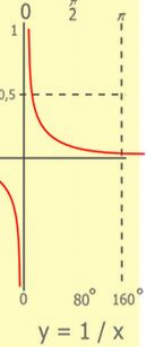
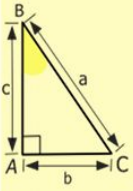
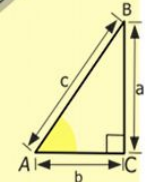
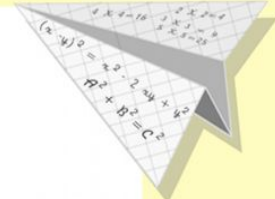
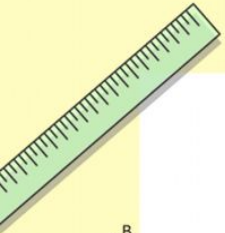
$$(x+y)(x-y) = x^2 - y^2$$



Тиймді тәсілі:

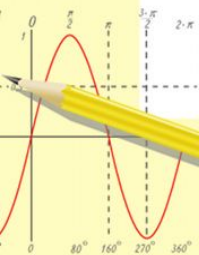


Үлкен саннан кішісін азайтамыз (орта),



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
- 5 x 5 = 25
- 6 x 6 = 36
- 7 x 7 = 49
- 8 x 8 = 64
- 9 x 9 = 81



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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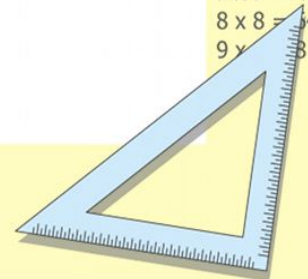
$$\sin 90^\circ = 1$$



$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



Мәтінді есептерді шығару

Жолдары

40 литр 5 %-дық тұз ерітіндісіне қанша су қосып 4 %-дық тұз ерітіндісін алуға болады?

$$40 \text{ л} \text{ ----} 5 \% = 0,05$$

$$x_{\text{л}} \text{ ----} 0 \%$$

$$y_{\text{л}} \text{ ----} 4 \% = 0,04$$

$$\begin{cases} 40 + x = y \\ 40 * 0,05 + x * 0 = y * 0,04 \end{cases} \Rightarrow \begin{cases} y = 40 + x \\ 2 = 0,04y \end{cases} \Rightarrow$$

$$0,04(40 + x) = 2$$

$$1,6 + 0,04x = 2$$

$$0,04x = 0,4$$

$$x = 10 \text{ л}$$

Жауабы: 10 литр

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

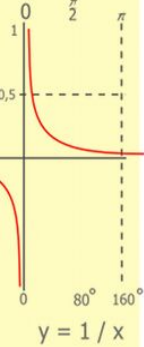
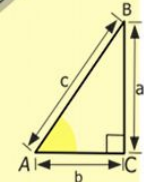
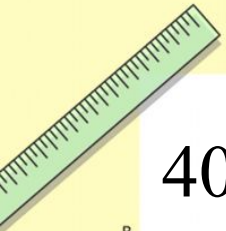
$$\sin 90^\circ = 1$$

$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

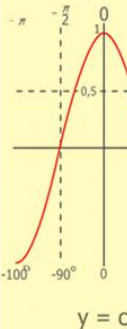
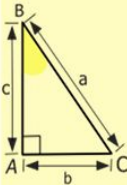
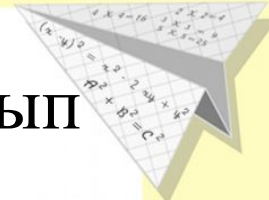
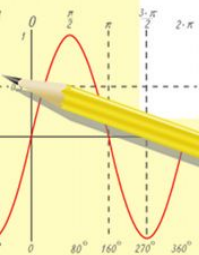
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

$$x = 70$$

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

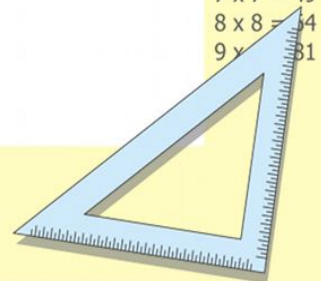


$$\begin{array}{r} 1 \ 5 \ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

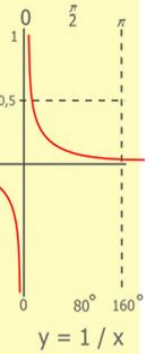
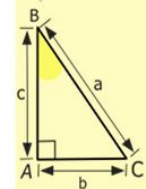
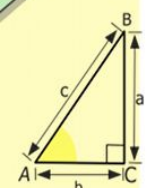
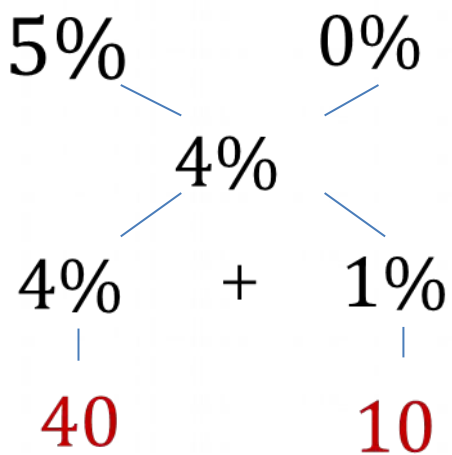
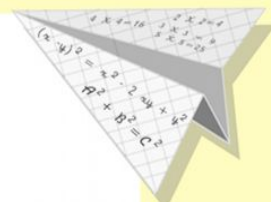
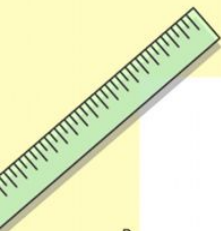


$$y = \cos$$

$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$

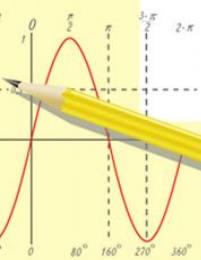


Тиймді тәсілі:



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

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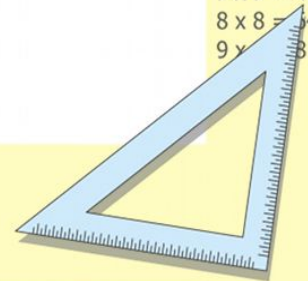
$\sin 90^\circ = 1$



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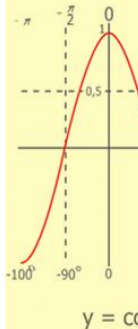
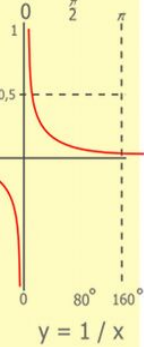
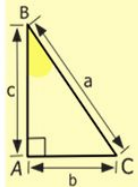
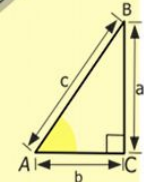
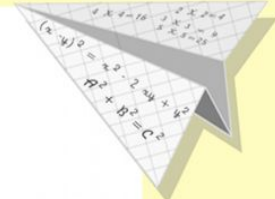
$$(x+y)(x-y) = x^2 - y^2$$



Геометриялық прогрессия

Кемімелі геометриялық

прогрессияның екінші мүшесі $\frac{1}{3}$ -ге, ал бірінші мен үшінші мүшелерінің қосындысы $\frac{10}{9}$ -ға тең. Төртінші мен екінші мүшелерінің көбейтіндісін табыңыз.



$$\begin{array}{r} 1 \\ \times 2500 \\ \hline 2500 \\ \times 42 \\ \hline 2100 \\ + 8400 \\ \hline 105000 \end{array}$$

- 2 x 2 = 4
- 3 x 3 = 9
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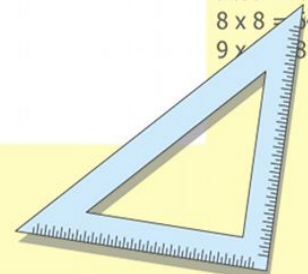
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$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



ШЫҒАРУ ЖОЛЫ:

$$\begin{cases} b_1 q = \frac{1}{3} \\ b_1 + b_1 q^2 = \frac{10}{9} \end{cases} \Rightarrow \begin{cases} b_1 q = \frac{1}{3} \\ b_1(1 + q^2) = \frac{10}{9} \end{cases} \Rightarrow$$

$$\frac{1 + q^2}{q} = \frac{10}{9} \cdot 3 \Rightarrow 3(1 + q^2) = 10q \Rightarrow 3q^2 - 10q + 3 = 0$$

$$D_1 = 25 - 9 = 16$$

$$q = \frac{5 \pm 4}{3};$$

$$q = \frac{1}{3}; q = 3$$

$$b_1 = \frac{1}{3} : \frac{1}{3} = 1$$

$$b_4 = b_1 \cdot q^3 = 1 \cdot \frac{1}{27} = \frac{1}{27}$$

$$b_4 \cdot b_2 = \frac{1}{27} \cdot \frac{1}{3} = \frac{1}{81}$$

$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

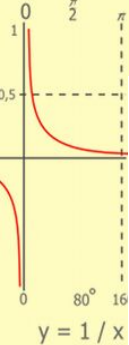
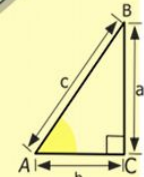
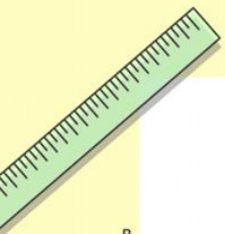
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

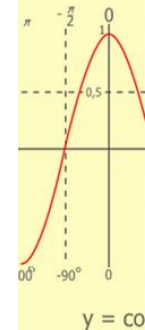
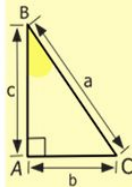
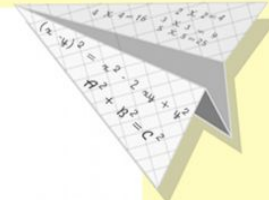
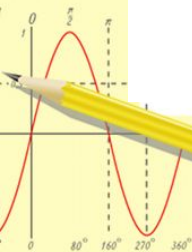
$$\begin{cases} x = 25y + 45 \\ y = 1 \end{cases}$$

$$\begin{cases} x = 25 + 45 \\ x = 70 \end{cases}$$

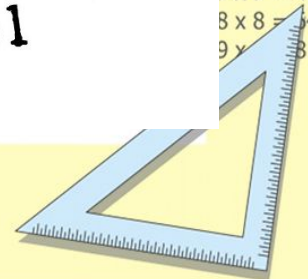
$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 2100 \\ + 8400 \\ \hline 105000 \end{array}$$



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$

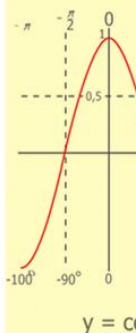
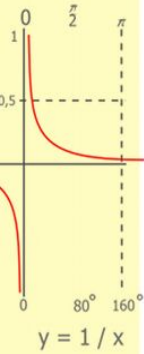
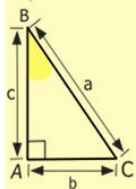
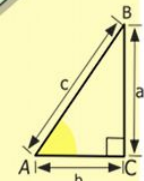
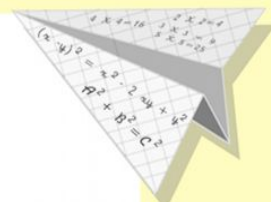
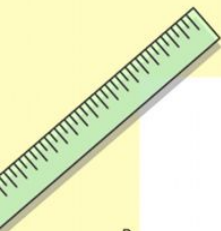


Үйімді тәсілі:

$$1, \frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}, \dots \dots \dots \text{кемімелі}$$

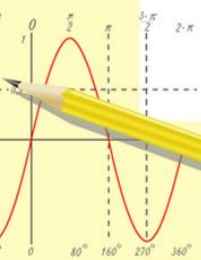
$$\frac{1}{9}, \frac{1}{3}, 1, 3, 9, 27, \dots \dots \dots \text{өспелі}$$

$$b_2 * b_4 = \frac{1}{3} * \frac{1}{27} = \frac{1}{81}$$



$$\begin{array}{r} \frac{1}{2} 500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

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- 3 x 3 = 9
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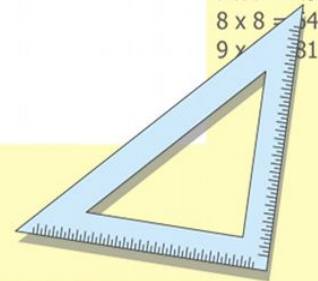
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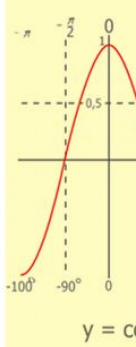
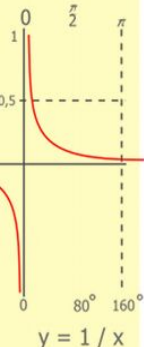
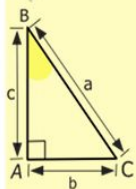
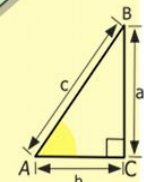


Тригонометриялық өрнектер

$$\frac{2\sin\alpha + 3\cos\alpha}{5\sin\alpha - \cos\alpha}, \text{ егер } \operatorname{ctg}\alpha = -2.$$

$$\frac{(2\sin\alpha + 3\cos\alpha) : \sin\alpha}{(5\sin\alpha - \cos\alpha) : \sin\alpha} = \frac{2 + 3\operatorname{ctg}\alpha}{5 - \operatorname{ctg}\alpha} =$$

$$= \frac{2 + 3 \cdot (-2)}{5 - (-2)} = \frac{2 - 6}{5 + 2} = -\frac{4}{7}.$$



$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$

- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
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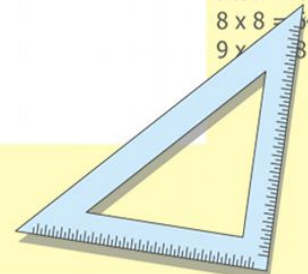


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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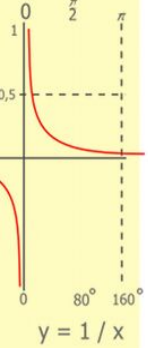
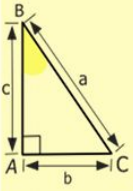
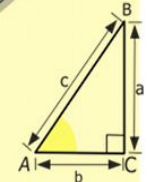
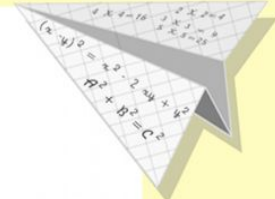
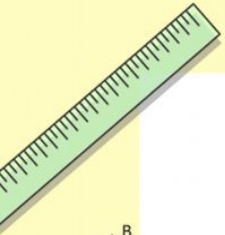
$$x = 70$$



Үйімді тәсілі:

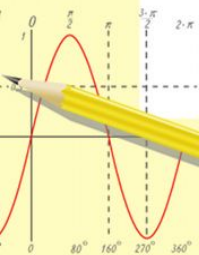
$$\cot \alpha = \frac{\cos \alpha}{\sin \alpha} = -2 = \frac{-2}{1}$$

$$\frac{2 \sin \alpha + 3 \cos \alpha}{5 \sin \alpha - \cos \alpha} = \frac{2 * 1 + 3 * (-2)}{5 * 1 - (-2)} = \frac{-4}{7}$$



$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$

- $2 \times 2 = 4$
- $3 \times 3 = 9$
- $4 \times 4 = 16$
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$$\sin 90^\circ = 1$$

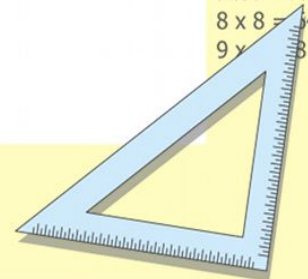


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

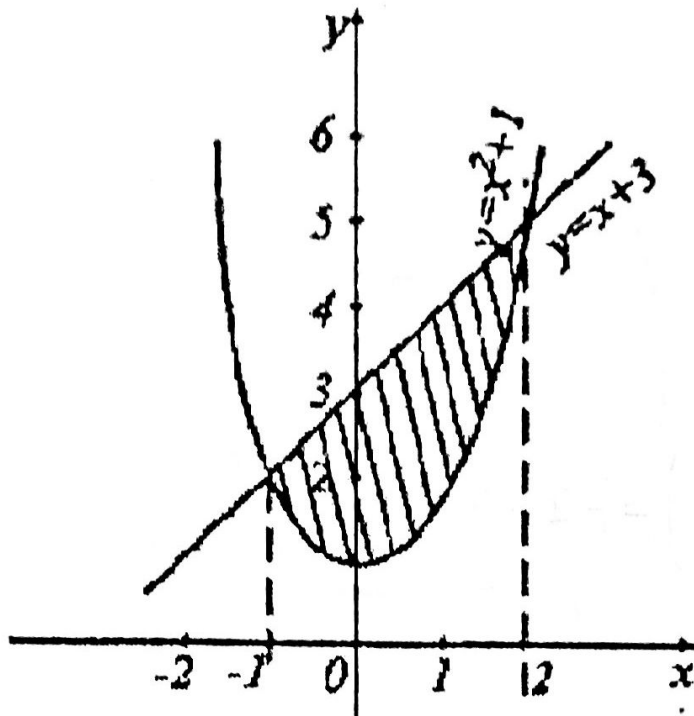
$$x = 70$$

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



Жазық фигуралардын аудандарын есептеу

$$S = \int_a^b (f(x) - g(x)) dx.$$



$$\begin{aligned} y &= x^2 + 1 \text{ және } y = x + 3 \\ x^2 + 1 &= x + 3 \\ x^2 - x - 2 &= 0 \\ x_1 &= -1; x_2 = 2 \end{aligned}$$

$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

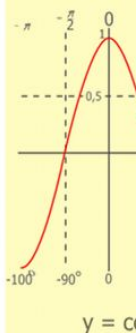
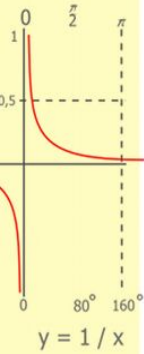
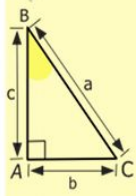
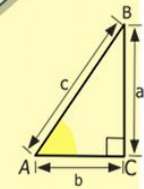
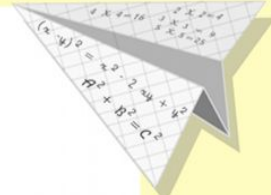
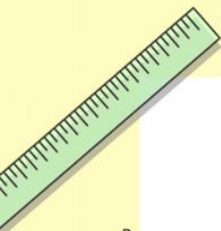
$$\sin 90^\circ = 1$$

$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

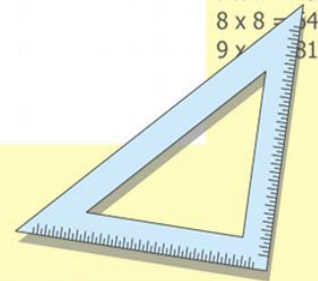
$$x = 70$$

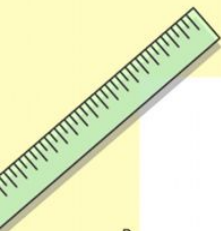
$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
- 5 x 5 = 25
- 6 x 6 = 36
- 7 x 7 = 49
- 8 x 8 = 64
- 9 x 9 = 81




$$y = x^2 + 1 \text{ және } y = x + 3$$

$$x^2 + 1 = x + 3$$

$$x^2 - x - 2 = 0$$

$$x_1 = -1; x_2 = 2$$

$$S = \int_{-1}^2 ((x + 3) - (x^2 + 1)) dx = \int_{-1}^2 (x + 2 - x^2) dx =$$

$$= \left(\frac{x^2}{2} + 2x - \frac{x^3}{3} \right) \Big|_{-1}^2 = \left(2 + 4 - \frac{8}{3} \right) - \left(\frac{1}{2} - 2 + \frac{1}{3} \right) = 4 \frac{1}{2}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

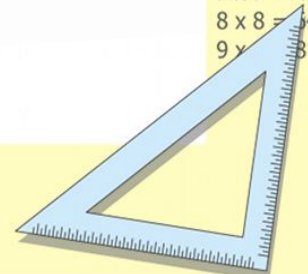


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

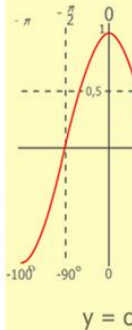
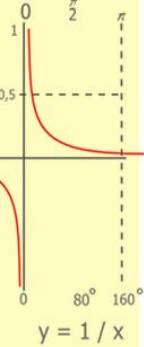
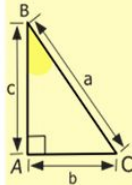
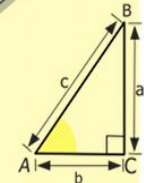
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

$$x = 70$$

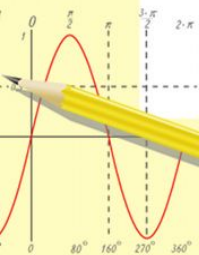
$$(x+y)(x-y) = x^2 - y^2$$



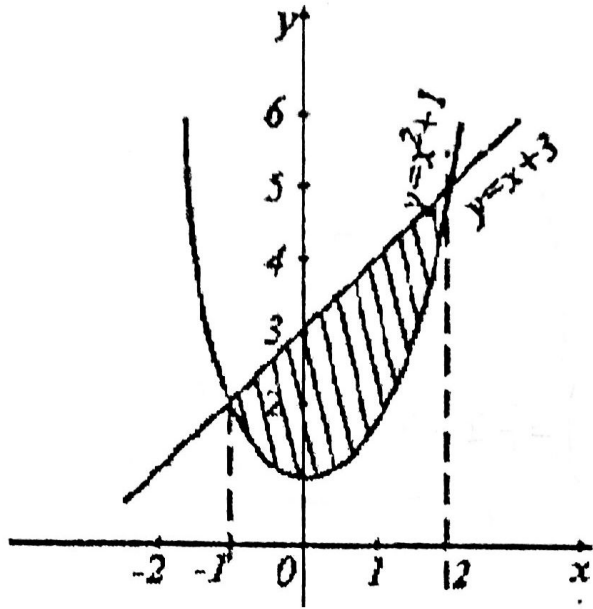
- 2 x 2 = 4
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- 9 x 9 = 81



$$\begin{array}{r} 1\ 5\ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105\ 000 \end{array}$$



Тиймді тәсілі:



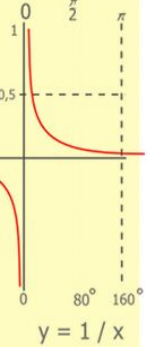
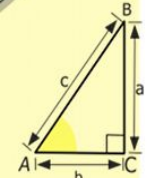
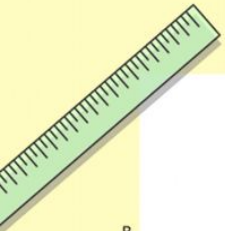
$$x_1 = -1 \quad x_2 = 2$$

$$S = \left| \frac{a(x_2 - x_1)}{6} \right|$$

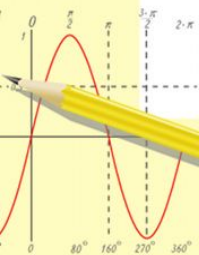
$$S = \left| \frac{1 * (2 - (-1))}{6} \right| = \frac{27}{6} = 4 \frac{3}{6} = 4 \frac{1}{2}$$

$$S = \frac{ab}{3} \text{ (боялған)}$$

$$S = \frac{2ab}{3} \text{ (боялмаған)}$$



$$\begin{array}{r} \frac{1}{2} 500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

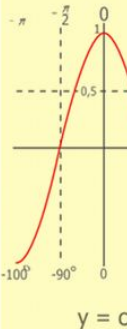
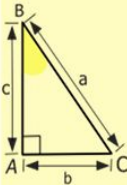
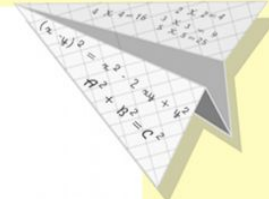
$$\sin 90^\circ = 1$$



$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

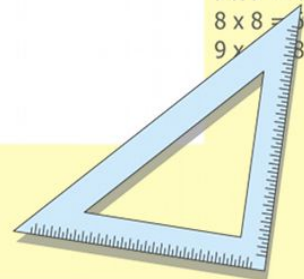
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



$$y = \cos$$

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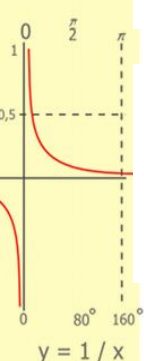
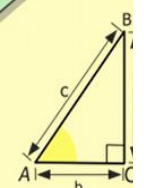
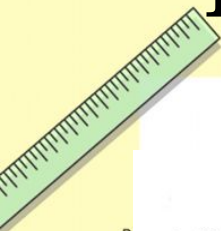


Көрсеткіштік теңдеулер жүйесін шешу

$$\begin{cases} 2^x - 3^y = 23, \\ 2^{x-1} + 3^{y+1} = 43; \end{cases} \Rightarrow \begin{cases} 2^x = 3^y + 23, \\ \frac{2^x}{2} + 3 \cdot 3^y = 43 | \cdot 2 \end{cases} \Rightarrow$$

$$\begin{cases} 2^x = 3^y + 23 \\ 3^y + 23 + 6 \cdot 3^y = 86; \end{cases} \Rightarrow \begin{cases} 7 \cdot 3^y = 63, \\ 2^x = 3^y + 23; \end{cases} \Rightarrow$$

$$\begin{cases} 3^y = 9, \\ 2^x = 3^y + 23 \end{cases} \Rightarrow \begin{cases} y = 2, \\ 2^x = 32 \end{cases} \Rightarrow \begin{cases} y = 2, \\ x = 5. \end{cases}$$



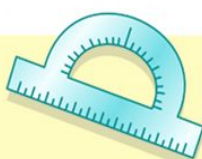
$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$



$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

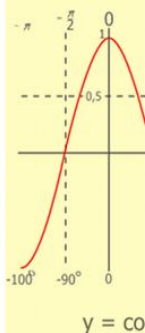
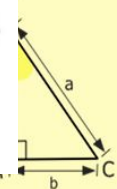


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

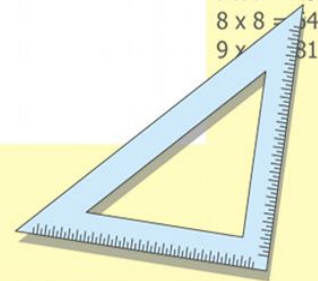
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

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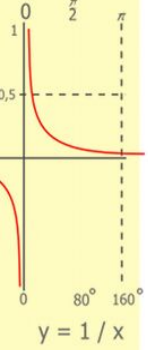
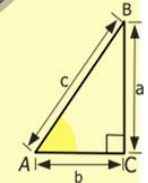
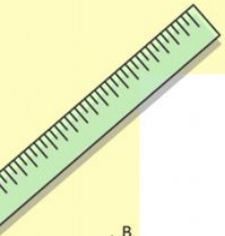


Тиймді тәсілі:

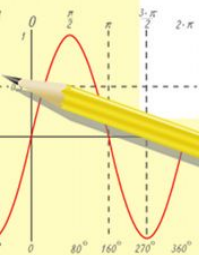
$$\begin{cases} 2^x - 3^y = 23, \\ 2^{x-1} + 3^{y+1} = 43; \end{cases}$$

$$\begin{array}{r} 2 \\ 4 \\ 8 \\ 16 \\ 32 \end{array} - \begin{array}{r} 3 \\ 9 \\ 27 \\ 81 \\ 243 \end{array} = 23$$

$$x = 5 \quad y = 2$$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

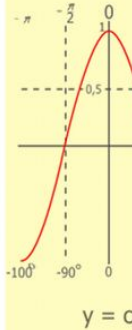
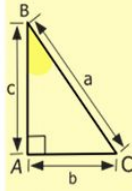
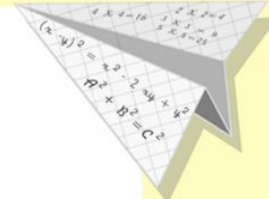


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

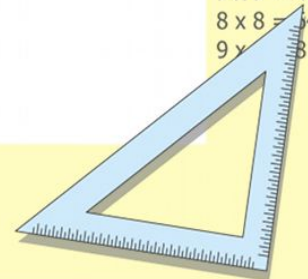
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

$$x = 70$$

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



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



Көрсеткіштік теңсіздіктерді шешу

$$4 * 3^{x+2} - 2 * 5^{x+2} \leq 5^{x+3} - 3^{x+3}$$

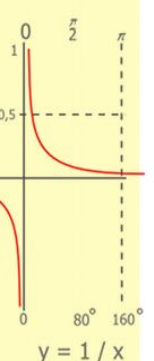
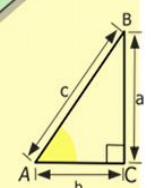
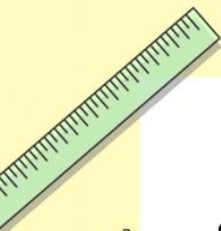
A) $[-1; +\infty)$

B) $[0; +\infty)$

C) $(-\infty; 0]$

D) $[-2; +\infty)$

E) $(3; +\infty)$



$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

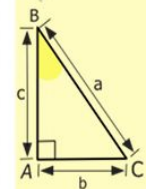
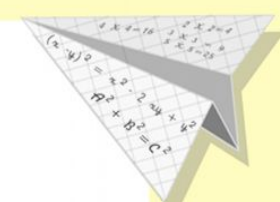
$\sin 90^\circ = 1$



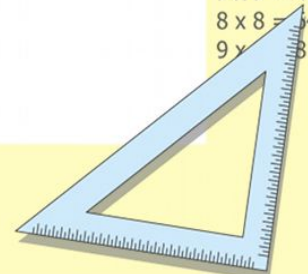
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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



2 x 2 = 4
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Тиімді тәсілі

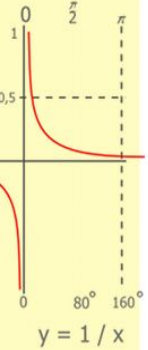
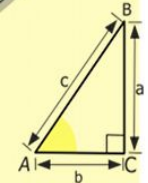
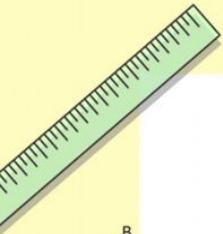
$$4 * 3^{x+2} - 2 * 5^{x+2} \leq 5^{x+3} - 3^{x+3}$$

$$x = -1 \quad 4 * 3 - 2 * 5 \leq 25 - 9 \quad 2 \leq 16$$

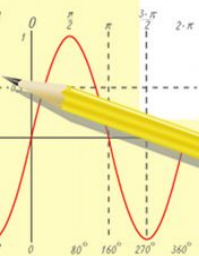
-1 деген мән шығу үшін  тең болу керек

$$x = 0 \quad 4 * 9 - 2 * 25 \leq 125 - 27 \quad -14 \leq 98$$

$$x = -2 \quad 4 * 1 - 2 * 1 \leq 5 - 3 \quad 2 \leq 2$$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 2100 \\ + 840 \\ \hline 105000 \end{array}$$



$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

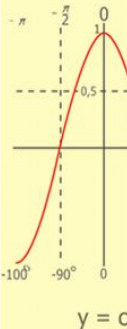
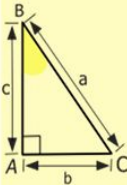
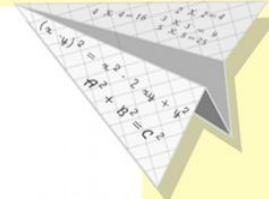
$$\sin 90^\circ = 1$$



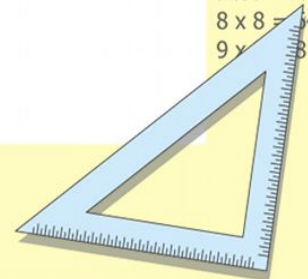
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



Назарларыңызға
рахмет!!!!

