

$$1) \textcircled{B} \quad \sqrt[3]{16} = 2$$

$$2) \frac{2,5^{36}}{36^9} = \frac{2,5^{36}}{6^{18}} = \frac{(2,5^2)^{18}}{6^{18}} = \frac{6,25^{18}}{6^{18}} = \left(\frac{6,25}{6}\right)^{18} = \left(\frac{25}{27}\right)^{18} = \left(\frac{25}{25}\right)^{-18} = 0,96^{-18} \textcircled{B}$$

$$3) 100 \rightarrow 120 \rightarrow 156 \textcircled{B}$$

$$4) 1h - 7x < 3x \quad \textcircled{D}$$

$$1h < 4x$$

$$3,5 < x$$

$$5) x^4 + y^4 - 2x^2y^2 \quad (x^2 - y^2)^2 = x^4 - 2x^2y^2 + y^4$$

$$(x^2 - y^2)^2 \quad \textcircled{A}$$

$$6) x = 0 \vee x = -3 \vee x = 2 \quad \textcircled{B}$$

$$7) x : 8 = 8x + 6 \quad \textcircled{C}$$

$$8) -\frac{16}{-8} = 2 = p \quad ; \quad q = 5$$

$$-5(2)^2 + 16(2) + m = 5$$

$$-18 + 32 + m = 5$$

$$18 + m = 5 \Rightarrow m = -13$$

$$9) b = \frac{a}{a} \cdot a^3 = a^3 \quad \textcircled{B}$$

$$10) A \cancel{\times} \cancel{\times} \quad \textcircled{A}$$

$$11) \quad ((x + \sqrt{17}) + 1)((x + \sqrt{17}) - 1) < 0$$

~~$(x + \sqrt{17}) - 1 = 0$~~

$(x + \sqrt{17})^2 < 1$

~~$x^2 + 2x\sqrt{17} + 17 - 1 < 0$~~

~~$x^2 + 2x\sqrt{17} + 16 < 0$~~

~~$\Delta = b^2 - 4ac = 0$~~

~~$x_1 = x_2 = -\frac{2\sqrt{17}}{2} = -\sqrt{17}$~~

~~$(x + \sqrt{17})(x + \sqrt{17}) < 0$~~

~~$\text{Wurzelklammern}$~~

$$12) \quad (8^{-\frac{1}{2}} - \sqrt{2})^{-1} = \left(\frac{1}{\sqrt{8}} - \sqrt{2}\right)^{-1} = \left(\frac{1}{2\sqrt{2}} - \sqrt{2}\right)^{-1}$$

$$= \frac{1}{\left(\frac{1}{2\sqrt{2}} - \sqrt{2}\right)} = \frac{1}{\frac{1}{2\sqrt{2}} - \frac{2}{2\sqrt{2}}} = \frac{1}{\frac{-3}{2\sqrt{2}}} =$$

$$= 1 \left( \frac{2\sqrt{2}}{-3} \right) = -\frac{2\sqrt{2}}{3}$$

$$13) \quad S = (5, 8) \quad P = (3, 6)$$

$$r = \sqrt{h+h} = 2\sqrt{2}$$

$$L = 2\pi 2\sqrt{2}$$

$$L = h\pi\sqrt{2} \quad \textcircled{A}$$

17)

$$\alpha_5^+ \alpha_{10}$$

$$\omega = \frac{r}{l}$$

15)

$$\alpha q_1 = 5h \Rightarrow q = \frac{5h}{g}$$

$$\alpha q_1^2 = 81$$

$$\frac{5h}{g} (q_1^2) = 81 \Rightarrow 5h q_1 = R$$

$$q_1 = 1,5$$

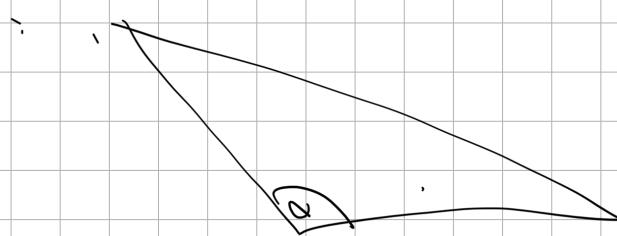
$$\alpha = 36$$

16)

$$1 = -1 + b$$

$$2 = b$$

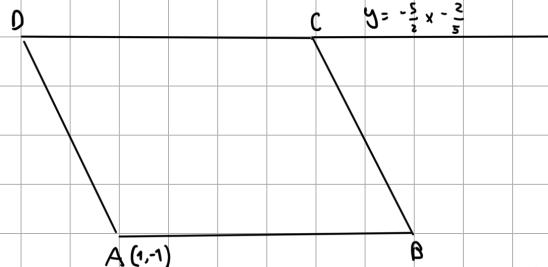
17)



$$5 = \sqrt{20 + 5}$$

$$x = \sqrt{5}$$

18)



$$A(1, -1)$$

$$B$$

$$C$$

$$y = -\frac{5}{2}x - \frac{2}{5}$$

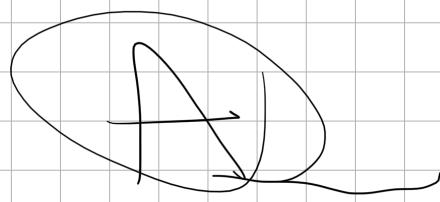
$$-\frac{5}{2}x - 1y - \frac{2}{5} = 0 ; A(1, -1)$$

$$\left| -\frac{5}{2}(1) + (-1)(-1) + \left(-\frac{2}{5}\right) \right| =$$

$$= \left| -\frac{5}{2} + 1 - \frac{2}{5} \right| = \left| -\frac{25}{10} + 1 - \frac{2}{10} \right| =$$

$$= \left| -\frac{25}{10} + 1 - \frac{2}{10} \right| =$$

$$\frac{19}{52} = \left(\frac{10}{19}\right)\left(\frac{52}{1}\right) = \frac{1052}{19}$$



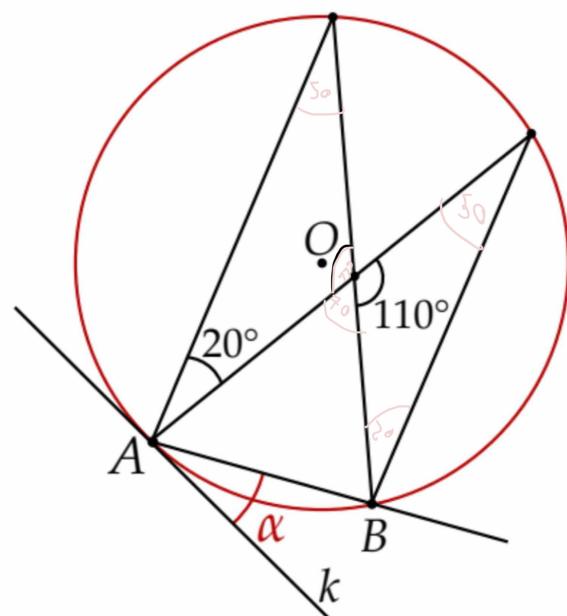
$$-1 = -\frac{5}{2} + b$$

$$-1 + \frac{5}{2} = b$$

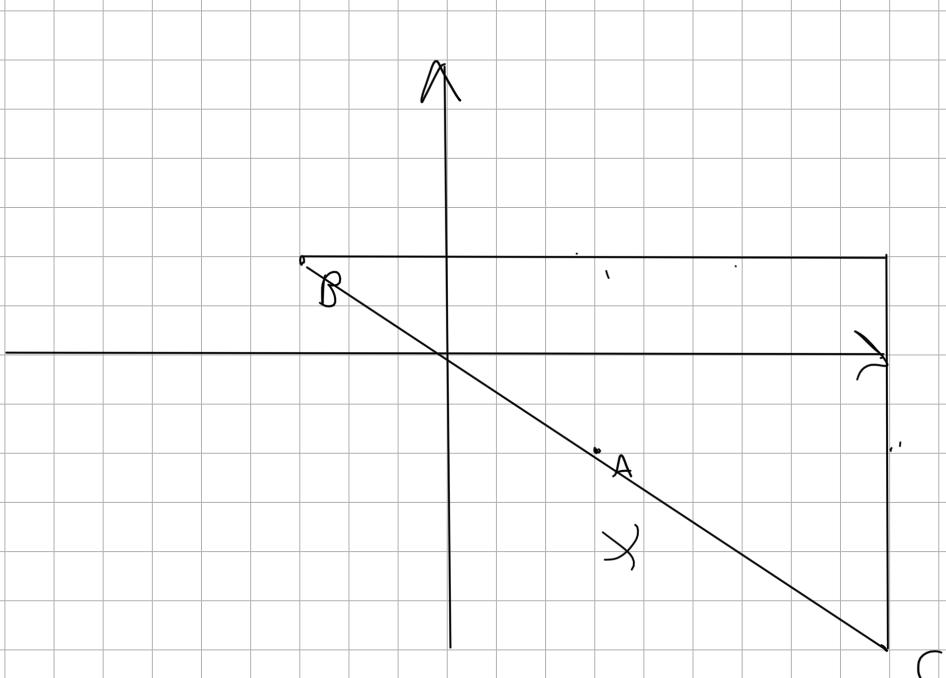
$$\frac{-2+5}{2} = b$$

$$\frac{3}{2} = b$$

19)

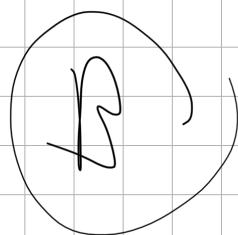


20)



$$\sqrt{12^2 + 8^2} = x^2$$

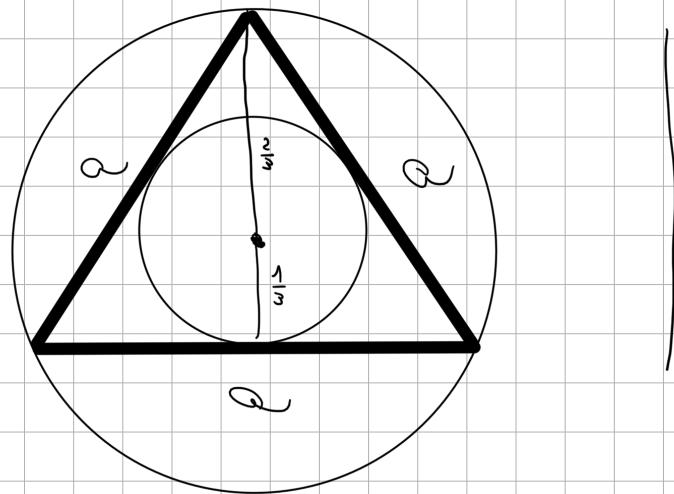
$$x = \sqrt{208}$$



29)

C

22)



$$\frac{\frac{2 \cdot a \sqrt{3}}{2}}{3} + \frac{\frac{a \sqrt{3}}{2}}{3} = 1$$

$$\frac{\frac{a \sqrt{3}}{2} + \frac{a \sqrt{3}}{2}}{3} = 1$$

$$\frac{1 \frac{1}{2} a \sqrt{3}}{3} = 1$$

$$0,5 a \sqrt{3} = 1$$

$$a \sqrt{3} = 2$$

$$a = 2 \sqrt{3}$$

B

23)

$$5x + 8 = 2y$$

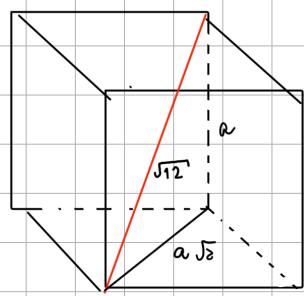
A

$$y = 2x + 8$$

$$5 \cdot 6 = 2 \cdot h$$

B

24)



$$a \sqrt{2}^2 + a^2 = \sqrt{12}^2$$

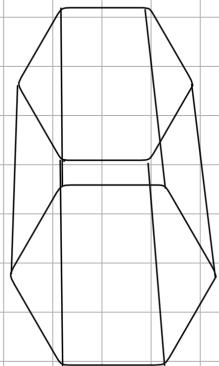
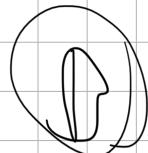
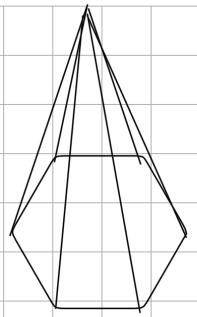
$$3a^2 = 12$$

$$a^2 = 4$$

$$a = 2$$

25)

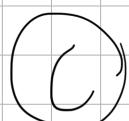
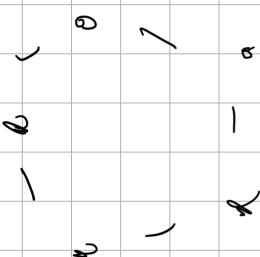
3 · x



$$3x - 2x = 12$$

$$x = 12$$

26



27)

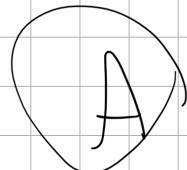
15, 16, 17, 18



28)

$$3 + 13 + 18 + 36 \rightarrow 10$$

$$\frac{27}{\overbrace{\quad}^{27}} = 3$$



29)

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

D:  $x \neq -3$  und  $x \neq 5$ 

$$2x^2 - 3x - 5 = x^2 - 6x + 9$$

 $x \neq 5$ 

$$x^2 + 3x - 18 = 0$$

$$D = 9 - 4 \cdot 1 \cdot 18 = 81 \quad \sqrt{D} = 9$$

$$x_1 = \frac{-3 - 9}{2} = -6$$

$$x_2 = \frac{-3 + 9}{2} = 3 \quad \notin D$$

30)  $\overline{1} 10\bar{y} \rightarrow r. 5$        $a_{r_1} = 10\bar{y}$        $r = 11$

$\overline{1} 11\bar{s} \rightarrow r. 5$

(82)

$\sqrt{a_{s_1} = 10\bar{y} + (80)11}$   
 $\sqrt{a_{s_2} = 10\bar{y} + (81)(11)}$   
 ~~$\times a_{s_3} = 10\bar{y} + (82)(11)$~~

31)  $x^2 - 2x \sqrt{x} + 2x > 0$

$$(x^2 - 2x \sqrt{x} + x) + x > 0$$

$$(x - \sqrt{x})^2 + x > 0$$

$$\underbrace{(x - \sqrt{x})^2}_{> 0} > -x$$

$$\underbrace{(x - \sqrt{x})^2}_{<} <$$

32)  $2 - 5x = (x+2)(x+17)$

$$2 - 5x = x^2 + 17x + 2x + 34$$

$$0 = -2 + 5x + x^2 + 17x + 2x + 34$$

$$x^2 + 23x + 32 = 0$$

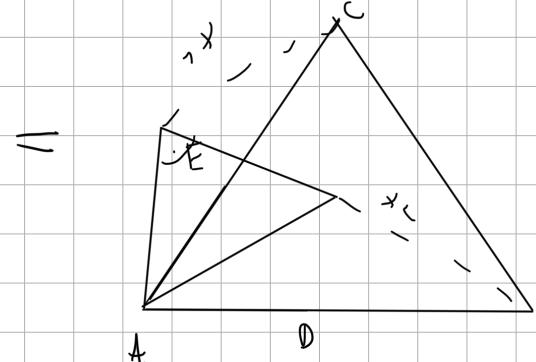
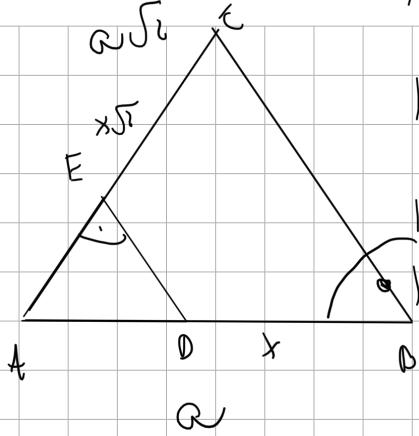
$$\Delta = 529 - 4(32) = 529 - 128 = 401$$

$$\sqrt{\Delta} = \sqrt{401}$$

$$x_1 = \frac{-23 - \sqrt{401}}{2} =$$

$$x_2 = \frac{-23 + \sqrt{401}}{2} =$$

33)

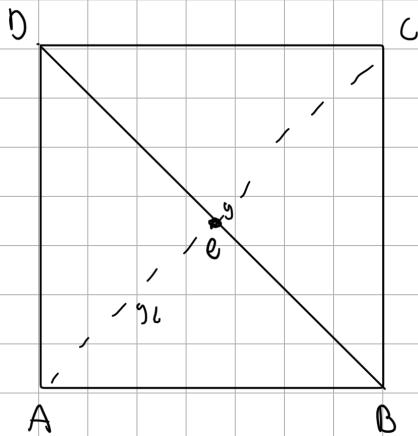


$$\left\{ x_1, x_2 \right\} = \text{const}$$

33)

$$\frac{1}{4}$$

35)



$$A \left( -3, -\frac{8}{3} \right)$$

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

$$\frac{\left| \begin{pmatrix} -4 \\ -1 \end{pmatrix} \begin{pmatrix} \frac{3}{7} \\ -\frac{8}{3} \end{pmatrix} + \begin{pmatrix} 1 \\ 3 \end{pmatrix} \right|}{\sqrt{\left( -\frac{4}{7} \right)^2 + \left( -\frac{8}{3} \right)^2}}$$

$$= \frac{(-3) + \frac{8}{3} + \frac{1}{3}}{1}$$

$$y = -\frac{2}{3}x + b$$

$$w(x) = -\frac{1}{m} \begin{pmatrix} 1 & 1 \end{pmatrix} + b$$

$$-\frac{2}{3} = \frac{16}{3} + b$$

$$-\frac{25}{3} = b$$

$$b = -8$$

$$y_2 = -\frac{2}{3}x - 8$$

$$\frac{2}{5}x + \frac{1}{3} = -\frac{3}{3}x - 8$$

$$\frac{9}{12}x + \frac{16}{12}x = -8 - \frac{1}{3}$$

$$\frac{25}{13} x = -8 \frac{7}{3}$$

$$\frac{25}{12}x = -\frac{25}{3}$$

$$\frac{25}{13} x = -\frac{100}{12} \quad | : 13$$

$$25x = -100$$

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

$$y = \left(\frac{1}{3}\right)\left(\frac{1}{5}\right) - 8 = \frac{1}{15} - 8 = \frac{1}{15} - 8 = -7\frac{2}{3}$$

$$P\left(-\frac{1}{5}, -7\frac{2}{3}\right)$$

$$-\frac{8}{3} = -h\alpha + b$$

$$-\frac{8}{3} + h\alpha = b$$

$$-7\frac{2}{3} = -\frac{1}{5}\alpha + \frac{8}{3} + h\alpha$$

$$-7\frac{2}{3} = -\frac{8}{3} + \frac{3}{5}\alpha$$

$$-\frac{23}{3} + \frac{8}{3} = \frac{15}{5}\alpha$$

$$-\frac{15}{3} = \frac{15}{5}\alpha$$

$$-3 = \frac{15}{5}\alpha \quad | \cdot h$$

$$-12 = 15\alpha$$

$$P\left(-\frac{1}{5}, -\frac{23}{3}\right) A\left(-3, -\frac{8}{3}\right)$$

$$|PA| = \sqrt{\left(-3 - \frac{1}{5}\right)^2 + \left(-\frac{8}{3} - \frac{23}{3}\right)^2}$$

$$|PA| = \sqrt{\left(-3 - \frac{1}{5}\right)^2 + \left(-\frac{31}{3}\right)^2}$$

$$= \sqrt{\left(-\frac{15}{5}\right)^2 + \left(-\frac{31}{3}\right)^2} =$$

$$= \sqrt{\frac{225}{25} + \frac{961}{9}} =$$