

$$1. \textcircled{B} \sqrt{x^2-9} = 4$$

принимать $x^2-9 \geq 0$

$$x^2-9=16$$

$$x^2=25$$

$$\frac{x=5}{\checkmark}$$

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

Евгения

21

$$2. \textcircled{B} \sqrt{25-x^2} = \sqrt{2x+1}$$

$$25-x^2 = 2x+1$$

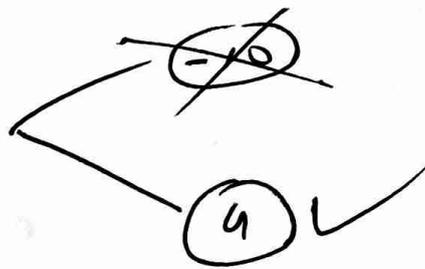
$2x+1 \geq 0$

$25-x^2 \geq 0$

$$-x^2-2x+24=0$$

$$\Delta = 4 + 4 \cdot 24 = 100$$

$$x = \frac{2 \pm 10}{-2}$$



$$3. \textcircled{B} \quad x + \sqrt{x} - 2 = 0$$

$$\sqrt{x} = 2 - x$$

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

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

$$0 = x^2 - 5x + 4$$

$$\textcircled{x=1} \quad \checkmark \quad \textcircled{\cancel{x=4}}$$

$$x \geq 0$$

$$2 - x \geq 0$$

$$\textcircled{E} \quad \sqrt{x-1} = x-3$$

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

$$x-1 = x^2 - 6x + 9$$

$$x^2 - 7x + 10 = 0$$

$$\textcircled{\cancel{x=2}} \quad \textcircled{x=5} \quad \checkmark$$

$$x-3 \geq 0$$

$$x-1 \geq 0$$

$$4. \textcircled{A} \sqrt{1-x} + x = 2x + 5$$

$$\sqrt{1-x} = x + 5$$

$$\underline{1-x \geq 0}$$

$$\underline{x+5 \geq 0}$$

$$1-x = (x+5)^2$$

$$1-x = x^2 + 10x + 25$$

$$x^2 + 11x + 24 = 0$$

$$\Delta = 25$$

$$x = \frac{-11 \pm 5}{2}$$

$$\textcircled{-3} \checkmark$$

$$\textcircled{-8} \times$$

$$8. \textcircled{B} \sqrt{x+3} + \sqrt{3x-2} = 7$$

$$\underline{x+3 \geq 0}$$

$$\underline{3x-2 \geq 0}$$

$$\left(\sqrt{x+3} + \sqrt{3x-2}\right)^2 = 7^2$$

$$x+3 + 2\sqrt{x+3}\sqrt{3x-2} + 3x-2 = 49$$

$$4x + 1 + 2\sqrt{x+3}\sqrt{3x-2} = 49$$

$$2\sqrt{x+3}\sqrt{3x-2} = 48 - 4x$$

$$\textcircled{52} \quad \sqrt{x-1} = \sqrt{x+2} - \sqrt{3x-5}$$

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

$$x-1 \geq 0$$

$$x+2 \geq 0$$

$$3x-5 \geq 0$$

$$\cancel{x-1} + 2\sqrt{x-1}\sqrt{3x-5} + 3x-5 = \cancel{x+2}$$

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

$$\sqrt{x+2} - \sqrt{3x-5} \geq 0$$

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

$$11 - 3x \geq 0$$

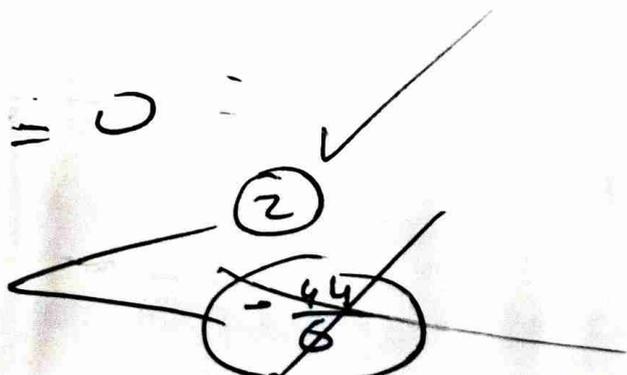
$$4(x-1)(3x-5) = (8-3x)^2$$

$$4(3x^2 - 5x - 3x + 5) = 64 - 48x + 9x^2$$

$$12x^2 - 32x + 20 = 64 - 48x + 9x^2$$

$$3x^2 + 16x - 44 = 0$$

$$x = \frac{-16 \pm 28}{6}$$



$$\sqrt{x+3} \sqrt{3x-2} = 24-2x$$

$$\underline{24-2x \geq 0}$$

$$(x+3)(3x-2) = (24-2x)^2$$

$$3x^2 - 2x + 9x - 6 = 576 - 96x + 4x^2$$

$$-x^2 + 103x - 582 = 0 \quad \checkmark$$

$$x = \frac{-103 \pm 91}{-2}$$

6
~~97~~

Answer

$$15. \textcircled{a} 4^x - 32 \cdot 2^x > 0$$

$$(2^x)^2 - 32 \cdot 2^x > 0$$

$$\underline{\underline{2^x = t}}$$

$$t^2 - 32t > 0$$

$$t(t - 32) > 0$$

$$\begin{array}{cc} \downarrow & \downarrow \\ \textcircled{0} & \textcircled{32} \end{array}$$

t	0	32	
$t^2 - 32t$	+	-	+

$$t < 0 \quad \vee \quad t > 32$$

$$2^x < 0$$

Аналогично

$$2^x > 2^5$$

$$\underline{\underline{x > 5}}$$

Евотута

23

24.

$$\textcircled{a} \quad \frac{e^x - 1}{e^x + 2} > 0$$

$\textcircled{+}$

$$\Rightarrow e^x - 1 > 0$$

$$e^x > 1$$

$$e^x > e^0$$

$$\underline{\underline{x > 0}}$$

27.

$$\textcircled{a} \quad 16^x - 8^x - 2^{x+2} + 4 = 0$$

$$(2^x)^4 - (2^x)^3 - 2^x \cdot 2^2 + 4 = 0$$

$$\textcircled{2^x = \lambda}$$

$$\lambda^4 - \lambda^3 - 4\lambda + 4 = 0$$

$$\lambda^3(\lambda - 1) - 4(\lambda - 1) = 0$$

$$(\lambda - 1)(\lambda^3 - 4) = 0$$

$$\lambda - 1 = 0$$

$$\lambda = 1$$

$$\wedge \quad \lambda^3 - 4 = 0$$

$$\lambda^3 = 4$$

$$2^x = 1$$

$$2^x = 2^0$$

$$x = 0$$

$$v \quad (2^x)^3 = 4$$

$$2^{3x} = 2^2$$

$$3x = 2$$

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

6. (a)

$$\frac{x-3}{x+1} > 0$$

x	-1	3
x-3	-	-0+
x+1	-0+	+
~	+	-+

Answers
20

$$x \in (-\infty, -1) \cup (3, +\infty)$$

(b)

$$\frac{x}{x-1} > 0$$

x	0	1
x	-	0+ +
x-1	-	-0+
P(x)	+	-+

$$x \in (-\infty, 0) \cup (1, +\infty)$$

7. (a) $\frac{5x-2}{2x-1} > 3$

$$\frac{5x-2}{2x-1} - 3 > 0$$

$$\frac{5x-2}{2x-1} - \frac{3(2x-1)}{2x-1} > 0$$

$$\frac{5x-2-6x+3}{2x-1} > 0$$

$$\frac{-x+3}{2x-1} > 0$$

x	$\frac{1}{2}$	3
-x+3	+	+0-
2x-1	-0+	+
P(x)	-	+ -

$$x \in \left(\frac{1}{2}, 3\right)$$