30 GÜNDE DGS TEK. RAR

16. GÜN

- Köklü Sayılar

1. $\sqrt[3]{24+\sqrt[3]{25+\sqrt{4}}} = \sqrt[3]{24+\sqrt[3]{25+2}}$

$\sqrt[3]{24+\sqrt[3]{25}} = \sqrt[3]{24+3} = \sqrt[3]{27} = 3$

Cevap: C

2. $\sqrt[5]{38-\sqrt{39+\sqrt[3]{-27}}} = \sqrt[5]{38-\sqrt{39-3}}$

$= \sqrt[5]{38-\sqrt{36}} = \sqrt[5]{38-6} = \sqrt[5]{32} = 2$

Cevap: A

3. $\dfrac{\sqrt{1-\sqrt{1-\frac{7}{16}}}}{\sqrt{1-\frac{3}{4}}} = x \Rightarrow \dfrac{\sqrt{1-\sqrt{\frac{9}{16}}}}{\sqrt{\frac{1}{4}}} = x$

$\Rightarrow \dfrac{\sqrt{1+\frac{3}{4}}}{\frac{1}{2}} = x \Rightarrow \dfrac{\sqrt{\frac{1}{4}}}{\frac{1}{2}} = x$

$\Rightarrow \dfrac{\frac{1}{2}}{\frac{1}{2}} = x = 1$

Cevap: A

4. $\sqrt{147}-\sqrt{48}-\sqrt{75}+\sqrt{12}$

$= 7\sqrt{3}-4\sqrt{3}-5\sqrt{3}+2\sqrt{3}$

$= (7-4-5+2)\sqrt{3}$

$= 0 \cdot \sqrt{3}$

$= 0$

Cevap: A

5. $\dfrac{\sqrt{0,16}+\sqrt{0,01}}{\sqrt{0,36}-\sqrt{0,04}} = \dfrac{0,4+0,1}{0,6-0,2} = \dfrac{0,5}{0,4}$

$= \dfrac{5}{4}$

Cevap: B

6. $\dfrac{\sqrt{0,4}+\sqrt{0,9}-\sqrt{1,6}}{\sqrt{2,5}+\sqrt{4,9}-\sqrt{3,6}} = \dfrac{\frac{4}{10}+\sqrt{\frac{9}{10}}-\sqrt{\frac{16}{10}}}{\frac{25}{10}+\sqrt{\frac{49}{10}}-\sqrt{\frac{36}{10}}}$

$= \dfrac{\frac{2+3-4}{\sqrt{10}}}{\frac{5+7-6}{\sqrt{10}}} = \dfrac{\frac{1}{\cancel{\sqrt{10}}}}{\frac{6}{\cancel{\sqrt{10}}}} = \dfrac{1}{6}$

Cevap: C

7. $\dfrac{\sqrt{0,0064}+0,12}{0,01} = \dfrac{\sqrt{\frac{64}{10000}}+0,12}{0,01}$

$= \dfrac{\frac{8}{100}+\frac{12}{100}}{\frac{1}{100}} = \dfrac{\frac{20}{100}}{\frac{1}{100}} = \dfrac{20}{\cancel{100}} \cdot \dfrac{\cancel{100}}{1} = 20$

Cevap: E

8. $\sqrt{12}+\sqrt{27}-\dfrac{9}{\sqrt{3}} = 2\sqrt{3}+3\sqrt{3}-\dfrac{9\sqrt{3}}{3}$ ($\sqrt{3}$)

$= 5\sqrt{3}-3\sqrt{3}$

$= 2\sqrt{3}$

Cevap: B

9. $\dfrac{\frac{5+1}{\sqrt{5}}}{\frac{5-1}{\sqrt{5}}} = \dfrac{6}{\cancel{\sqrt{5}}} \cdot \dfrac{\cancel{\sqrt{5}}}{4} = \dfrac{6}{4} = \dfrac{3}{2}$

Cevap:C

10. $\dfrac{\sqrt{90}-\sqrt{6,4}}{\sqrt{12,1}} = \dfrac{\sqrt{9.10}-\sqrt{\frac{64}{10}}}{\sqrt{\frac{121}{10}}}$

$= \dfrac{\frac{3\sqrt{10}}{1} - \frac{8}{\sqrt{10}}}{\frac{11}{\sqrt{10}}}$

$= \dfrac{\frac{30-8}{\sqrt{10}}}{\frac{11}{\sqrt{10}}} = \dfrac{22}{\cancel{\sqrt{10}}} \cdot \dfrac{\cancel{\sqrt{10}}}{11}$

$= 2$ bulunur.

Cevap: B

11. $\dfrac{\frac{1}{2+\sqrt{3}}}{\frac{2}{2-\sqrt{3}}} + \dfrac{\frac{3}{2-\sqrt{3}}}{\frac{2}{2+\sqrt{3}}} - 8$

$= \dfrac{2-\sqrt{3}}{4-3} + \dfrac{3(2+\sqrt{3})}{4-3} - 8$

$= 2-\sqrt{3}+6+3\sqrt{3}-8$

$= 8+2\sqrt{3}-8$

$= 2\sqrt{3}$

Cevap: D

12. $\sqrt{1584} = \sqrt{2^4 \cdot 3^2 \cdot 11}$

$= 2^2 \,.\, 3\sqrt{11}$

$\Rightarrow \sqrt{11}$ bilinmelidir.

1584	2
792	2
396	2
198	2
99	3
33	3
11	11
1	

Cevap: C

13. $\dfrac{\sqrt{7}}{2} \cdot \left(\dfrac{7+\sqrt{7}}{7-\sqrt{7}} - \dfrac{7-\sqrt{7}}{7+\sqrt{7}} \right)$

$\dfrac{\sqrt{7}}{2}\left(\dfrac{49+14\sqrt{7}+7}{49-7} - \dfrac{49-14\sqrt{7}+7}{49-7} \right)$

$\dfrac{\sqrt{7}}{2}\left(\dfrac{\cancel{49}+14\sqrt{7}+\cancel{7}-\cancel{49}+14\sqrt{7}-\cancel{7}}{42} \right) = \dfrac{\sqrt{7}}{2} \cdot \dfrac{28\sqrt{7}}{42}$

$= \dfrac{7}{3}$

Cevap: D

14. $\sqrt{(\sqrt{2}-\sqrt{3})^2} + \sqrt{(3-\sqrt{3})^2} + \sqrt[4]{(-2)^2}$

$= |\sqrt{2}-\sqrt{3}| + |3-\sqrt{3}| + \sqrt[4]{4}$

$= \cancel{\sqrt{3}} - \cancel{\sqrt{2}} + 3 - \cancel{\sqrt{3}} + \cancel{\sqrt{2}}$

$= 3$

Cevap: D

15. $\dfrac{1-\sqrt{3}}{1+\sqrt{3}} - \dfrac{1+\sqrt{3}}{1-\sqrt{3}} = \dfrac{(1-\sqrt{3})^2-(1+\sqrt{3})^2}{1-3}$

$= \dfrac{1-2\sqrt{3}+3-(1+2\sqrt{3}+3)}{-2}$

$= \dfrac{\cancel{4}-2\sqrt{3}-\cancel{4}-2\sqrt{3}}{-2} = \dfrac{-4\sqrt{3}}{-2} = 2\sqrt{3}$

Cevap: D

16. $\dfrac{2\sqrt{7}+2}{\sqrt{21}-\sqrt{7}+\sqrt{3}-1} = \dfrac{2(\sqrt{7}+1)}{\sqrt{7}(\sqrt{3}-1)+\sqrt{3}-1}$

$= \dfrac{2(\sqrt{7}+1)}{(\sqrt{3}-1)(\sqrt{7}+1)} = \dfrac{2}{\sqrt{3}-1}$ ($\sqrt{3}+1$)

$= \dfrac{2(\sqrt{3}+1)}{3-1} = \dfrac{2(\sqrt{3}+1)}{2} = \sqrt{3}+1$

Cevap: C

17. $\dfrac{1}{a}+\dfrac{1}{b} = \dfrac{1}{\sqrt{3}+1}+\dfrac{1}{\sqrt{3}-1}$ ($\sqrt{3}-1$) ($\sqrt{3}+1$)

$\dfrac{\sqrt{3}-1+\sqrt{3}+1}{3-1} = \dfrac{2\sqrt{3}}{2} = \sqrt{3}$

Cevap: B

18. $(3+\sqrt{2})^2 = K$

$9+6\sqrt{2}+2 = K$

$11+6\sqrt{2} = K$

$6\sqrt{2} = K-11$

$\sqrt{2} = \dfrac{K-11}{6}$

Cevap: A

19. $\sqrt{\dfrac{x}{2}}+\sqrt{\dfrac{x}{8}}+\sqrt{\dfrac{x}{32}}=\dfrac{7}{2}$

$\dfrac{\sqrt{x}}{\sqrt{2}}+\dfrac{\sqrt{x}}{2\sqrt{2}}+\dfrac{\sqrt{x}}{4\sqrt{2}} = \dfrac{7}{2}$ (2)

$\dfrac{4\sqrt{x}+2\sqrt{x}+\sqrt{x}}{4\sqrt{2}} = \dfrac{7}{2}$

$\dfrac{7\sqrt{x}}{4\sqrt{2}} = \dfrac{7}{2} \Rightarrow \sqrt{x} = 2\sqrt{2}$ (2)

$x = 4 \cdot 2$

$x = 8$

Cevap: A

20. $(\sqrt{11}-\sqrt{7})^{2008} \cdot (\sqrt{11}+\sqrt{7})^{2008}$

$((\sqrt{11}-\sqrt{7}) \cdot (\sqrt{11}+\sqrt{7})$

$(11-7)^{2008} = 4^{2008} = 2^{4016}$

Cevap: C

21. $\dfrac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = x+y\sqrt{z}$ ($\sqrt{5}+\sqrt{3}$)

$\dfrac{(\sqrt{5}+\sqrt{3})^2}{5-3} = x+y\sqrt{z}$

$\dfrac{5+2\sqrt{15}+3}{2} = x+y\sqrt{z}$

$\dfrac{8+2\sqrt{15}}{2} = x+y\sqrt{z}$

$4+1 \cdot \sqrt{15} = x+y\sqrt{z}$

$x = 4, y = 1, z = 15$

$\Rightarrow x+y+z = 4+1+15 = 20$

Cevap: E

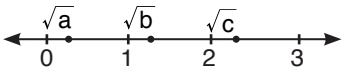
22. $0 < a < 1 \Rightarrow 0 < \sqrt{a} < 1$

$1 < b < 2 \Rightarrow 1 < \sqrt{b} < \sqrt{2}$

1'e yakın

$5 < b < 6 \quad \sqrt{5} < b < \sqrt{6}$

2 ile 3 arasında

$\Rightarrow$ 

Cevap: A

23. $\sqrt{79} < a < \sqrt{226}$

$\downarrow$

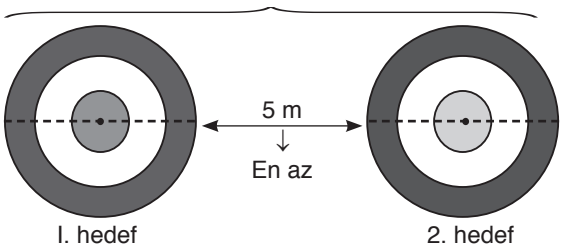
En az $\sqrt{81} = 9$

En çok $\sqrt{225} = 15$

$\Rightarrow \boxed{a} = 9 + 15 = 24$

Cevap: C

24. En çok = 150 cm + 5 m + 150 cm = 8 m



5 ile 8 arasında olabilir. Şıklar incelenirse,

$5 < 2\sqrt{11} < 8$ Her tarafın karesi alınır.

$25 < 44 < 64$

Cevap: D

25. $\sqrt[3]{2}\,.\sqrt[5]{3} = \sqrt[3]{2.\sqrt[5]{x}}$

$\sqrt[5\cdot3]{2^5}\,.\sqrt[3\cdot5]{3^3} = \sqrt[3\cdot5]{x\cdot2^5}$

$\sqrt[15]{2^5\cdot3^3} = \sqrt[15]{x\cdot2^5}$

$\Rightarrow 2^5\cdot3^3 = x\cdot2^5$

$x = 3^3 = 27$

Cevap: A

26. $\sqrt{\underset{a+5}{101}\cdot\underset{a+25}{121} - \underset{a}{96}\cdot\underset{a+30}{126}}$

$= \sqrt{(a+5)(a+25) - a\cdot(a+30)}$

$= \sqrt{a^2 + 30a + 125 - a^2 - 30a}$

$= \sqrt{125}$

$= 5\sqrt{5}$

Cevap: B

27. $a + b\sqrt{2} = \sqrt{4+\sqrt{12}} + \sqrt{4-\sqrt{15}}\cdot\sqrt{2}$

$= \sqrt{4+2\sqrt{3}} + \sqrt{8-2\sqrt{15}}$

$3\,.\,1 \qquad 5\,.\,3$

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

$= \sqrt{5} + 1$

Cevap: D

28. $\dfrac{x-1}{\sqrt{x}+1} = \dfrac{x}{\sqrt{x}-1}$

$\dfrac{(\sqrt{x}-1)(\sqrt{x}+1)}{\sqrt{x}+1} = \dfrac{x}{\sqrt{x}-1}$

$(\sqrt{x}-1)^2 = x$

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

$-2\sqrt{x} + 1 = 0$

$-2\sqrt{x} = -1$

$\sqrt{x} = \dfrac{1}{2} \Rightarrow x = \dfrac{1}{4}$

Cevap: C

29. $\dfrac{\sqrt{x-3}}{\sqrt{x-3}}\cdot\dfrac{\sqrt{x+3}}{4} = 1$

$\sqrt{x-3}\cdot\sqrt{x+3} = 4$

$\sqrt{x^2-9} = 4$

$x^2 - 9 = 16$

$x^2 = 25 \Rightarrow x = 5$

Cevap: D

30. $\frac{a-b}{a\sqrt{b}+b\sqrt{a}} = \frac{1}{2\sqrt{a}}$

$\frac{(\sqrt{a}+\sqrt{b})(\sqrt{a}-\sqrt{b})}{\sqrt{a}\sqrt{b}(\sqrt{a}+\sqrt{b})} = \frac{1}{2\sqrt{a}}$

$2\sqrt{a} - 2\sqrt{b} = \sqrt{b}$

$2\sqrt{a} = 3\sqrt{b}$ her iki tarafın karesi alınırsa

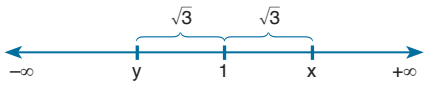
$(2\sqrt{a})^2 = (3\sqrt{b})^2$

$4a = 9b$ ise

$\frac{a}{b} = \frac{9}{4}$ olur.

Cevap: D

31.



$\Rightarrow x = 1+\sqrt{3}$ ve $y = 1-\sqrt{3}$ olur.

I. $x.y = (1+\sqrt{3})(1-\sqrt{3}) = 1-3 = -2$ olur. Doğru

II. $x - y = 1+\sqrt{3}-(1-\sqrt{3}) = 2\sqrt{3}$ olur. Doğru

III. $\frac{x}{y} = \frac{1+\sqrt{3}}{1-\sqrt{3}} = \frac{(1+\sqrt{3})^2}{1-3} = \frac{1+2\sqrt{3}+3}{-2}$

$= \frac{4+2\sqrt{3}}{-2}$

$= -2-\sqrt{3}$ olur. Doğru.

O halde I, II ve III doğru.

Cevap: E

32. $\left(\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-1}}\right)^2 = (\sqrt{x}+1)^2$

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

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

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

$1 = x - 1$

$x = 2$ olur.

Cevap: B

33. $x = \sqrt{ab-ba}$

$= \sqrt{9(a-b)}$

$3\underbrace{\sqrt{a-b}}_{1,4}$

$a-b = 1$: 9 8, ⋮, 2 1 } 8 tane

$a-b = 4$: 9 5, 5 1 } 5 tane

$8 + 5 = 13$ tane

Cevap: A

34. • $\sqrt{a}+\frac{b}{\sqrt{b}} = 24$ ise $\sqrt{a}+\frac{\not{b}\sqrt{b}}{\not{b}} = 24$

$\sqrt{a}+\sqrt{b} = 24$

• $a-b = 48$ ise $\underbrace{(\sqrt{a}-\sqrt{b})}_{2}\underbrace{(\sqrt{a}+\sqrt{b})}_{24} = 48$

Ohalde $\sqrt{a}+\sqrt{b} = 24 \rightarrow 13+\sqrt{b} = 24 \Rightarrow \sqrt{b} = 11$

$+\ \sqrt{a}-\sqrt{b} = 2$ $\qquad b = 121$

$2\sqrt{a} = 26$

$\sqrt{a} = 13 \Rightarrow a = 169$

• $a + b = 169 + 121 = 290$ olur.

Cevap: D

35. $(\sqrt{x}-\sqrt{y})^2 = (7)^2$

$x - 2\sqrt{xy} + y = 49$

$x - 2\sqrt{100} + y = 49$

$x - 20 + y = 49$

$x + y = 69$

Cevap: C

36. $(16)^{\sqrt{a}} = \sqrt[3]{4}$

$4^{2\sqrt{a}} = 4^{\frac{1}{3}} \Rightarrow 2\sqrt{a} = \frac{1}{3} \Rightarrow (2\sqrt{a})^2 = \left(\frac{1}{3}\right)^2$

$4a = \frac{1}{9}$

$a = \frac{1}{36}$

$\Rightarrow \sqrt{a} + \frac{1}{\sqrt{a}} = \sqrt{\frac{1}{36}} + \frac{1}{\sqrt{\frac{1}{36}}} = \frac{1}{6} + \frac{1}{\frac{1}{6}}$

$= \frac{1}{6} + 6 = \frac{37}{6}$

Cevap: E

37. $a = \sqrt[15]{6}$,

$b = \sqrt[5]{3} = \sqrt[3\cdot 5]{3^3} = \sqrt[15]{27}$

$c = \sqrt[3]{2} = \sqrt[5\cdot 3]{2^5} = \sqrt[15]{32}$

$\Rightarrow a < b < c$

Cevap: A

38.

$x = \frac{\sqrt{5}}{2}$ $x^2 = \frac{5}{4} = 1 + \frac{1}{4}$

$y = \frac{\sqrt{11}}{3}$ $y^2 = \frac{11}{9} = 1 + \frac{2}{9}$ $\Big\} \frac{1}{16} < \frac{2}{9} < \frac{1}{4}$

$z = \frac{\sqrt{17}}{4}$ $z^2 = \frac{17}{16} = 1 + \frac{1}{16}\Big\} 1 + \frac{1}{16} < 1 + \frac{2}{9} < 1 + \frac{1}{4}$

$z < y < x$

Cevap: E