1. $\dfrac{x^3-16x}{x^2-2x-8}\cdot\dfrac{x^2+x-2}{x^3+5x^2+4x}$

$=\dfrac{x(x^2-16)}{(x-4)(x+2)}\cdot\dfrac{(x+2)(x-1)}{x(x^2+5x+4)}$

$=\dfrac{\cancel{x}.\cancel{(x-4)}\cancel{(x+4)}}{\cancel{(x-4)}\cancel{(x+2)}}\cdot\dfrac{\cancel{(x+2)}(x-1)}{\cancel{x}.\cancel{(x+4)}(x+1)}$

$=\dfrac{x-1}{x+1}$ bulunur.

Cevap: B

2. $\dfrac{4x^2-y^2}{4x^2+4xy+y^2}:\dfrac{2x-y}{4x^2+2xy}$

$=\dfrac{\cancel{(2x-y)}\cancel{(2x+y)}}{\cancel{(2x+y)^2}}\cdot\dfrac{2x\cancel{(2x+y)}}{\cancel{(2x-y)}}$

$= 2x$ bulunur.

Cevap: C

3. $\dfrac{1}{b^2}-\dfrac{1}{a^2}=\dfrac{5}{36}$ ve $\dfrac{1}{a}+\dfrac{1}{b}=\dfrac{5}{6}$

$\left(\dfrac{1}{b}-\dfrac{1}{a}\right)\left(\dfrac{1}{b}+\dfrac{1}{a}\right)=\dfrac{5}{36}$

$\left(\dfrac{1}{b}-\dfrac{1}{a}\right)\cdot\dfrac{\cancel{5}}{\cancel{6}}=\dfrac{\cancel{5}}{\cancel{36}_{6}}$

$\dfrac{1}{b}-\dfrac{1}{a}=\dfrac{1}{6}$

$+\quad\dfrac{1}{b}+\dfrac{1}{a}=\dfrac{5}{6}$

$\dfrac{2}{b}=\dfrac{1}{6}+\dfrac{5}{6}=\dfrac{6}{6}=1$

$b = 2$ olur.

$\dfrac{1}{2}+\dfrac{1}{a}=\dfrac{5}{6}\Rightarrow\dfrac{1}{a}=\dfrac{5}{6}-\underset{(3)}{\dfrac{1}{2}}=\dfrac{2}{6}=\dfrac{1}{3}$

$a = 3$

O halde $a.b = 3.2 = 6$ bulunur.

Cevap: D

4. $\dfrac{7^4-3^4}{17^2-12^2}=\dfrac{(7^2-3^2)(7^2+3^2)}{(17-12)(17+12)}$

$=\dfrac{(49-9)(49+9)}{5.29}$

$=\dfrac{\overset{8}{\cancel{40}}.\overset{2}{\cancel{58}}}{\cancel{5}.\cancel{29}}=16$ bulunur.

Cevap: E

5. $\dfrac{x^2+mx+n}{x^2-5x-24}=\dfrac{x+1}{x+3}$

$\dfrac{x^2+mx+n}{x^2-5x-24}=\dfrac{(x+1)\cancel{(x-8)}}{(x+3)\cancel{(x-8)}}$

$x^2 + mx + n = (x + 1)(x - 8) = x^2 - 7x - 8$

$m = -7$ ve $n = -8$

$m.n = (-7).(-8) = 56$ bulunur.

Cevap: E

6. $\left(\dfrac{\dfrac{a^2-9}{a}}{(a-3)(a-1)}\right):\left(\dfrac{a+3}{\dfrac{a-1}{a}}\right)=\dfrac{1}{20}$

$\dfrac{(a-3)(a+3)}{a(a-3)(a-1)}:\dfrac{a(a+3)}{(a-1)}=\dfrac{1}{20}$

$\dfrac{\cancel{(a-3)}(a+3)}{a.\cancel{(a-3)}.\cancel{(a-1)}}\cdot\dfrac{\cancel{(a-1)}}{a.\cancel{(a+3)}}=\dfrac{1}{20}$

$\dfrac{1}{a^2}=\dfrac{1}{20}$

$\Rightarrow a^2 = 20$

$a = 2\sqrt{5}$ bulunur.

Cevap: B

7. $\frac{a+b}{a+2b} = \frac{3}{4}$

$4a + 4b = 3a + 6b$

$\boxed{a = 2b}$ yerine yazalım

$\frac{b^2+ab}{2a^2+b^2} = \frac{b^2+2b^2}{8b^2+b^2} = \frac{3b^2}{9b^2}$

$= \frac{1}{3}$ bulunur.

Cevap: A

8. $\frac{x^2-2x-15}{x^2-25} \cdot \frac{x^2+ax+b}{x^2-x-12} = \frac{x+1}{x-4}$

$\frac{\cancel{(x-5)}\cancel{(x+3)}}{\cancel{(x-5)}(x+5)} \cdot \frac{x^2+ax+b}{\cancel{(x-4)}\cancel{(x+3)}} = \frac{x+1}{\cancel{x-4}}$

$x^2 + ax + b = (x + 1)(x + 5)$ olmalı sadeleşme sonucu

$x^2 + ax + b = x^2 + 6x + 5$

$a = 6$ ve $b = 5$

$2b - 3a = 2.5 - 3.6$

$= 10 - 18$

$= -8$

Cevap: E

9. $\left(3x - \frac{3x^2+5y^2}{x+y}\right) \cdot \left(\frac{1}{y} + \frac{8}{3x-5y}\right)$

$= \left(\frac{\cancel{3x^2}+3xy-\cancel{3x^2}-5y^2}{x+y}\right) \cdot \left(\frac{3x-5y+8y}{3xy-5y^2}\right)$

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

$= 3$ bulunur.

Cevap: A

10. $\frac{8^8-1}{8^6-8^4+8^2-1}$

$= \frac{(8^4-1)(8^4+1)}{8^4(8^2-1)+(8^2-1)}$

$= \frac{(8^4-1)\cancel{(8^4+1)}}{(8^2-1)\cancel{(8^4+1)}}$

$= \frac{\cancel{(8^2-1)}(8^2+1)}{\cancel{(8^2-1)}}$

$= 64 + 1 = 65$ bulunur.

Cevap: D

11. $\frac{3x^2+13x-10}{x^2-25} \cdot \frac{27x^3+8}{9x^2-4}$

$\frac{\cancel{(3x-2)}\cancel{(x+5)}}{(x-5)\cancel{(x+5)}} \cdot \frac{\cancel{(3x+2)}(9x^2-6x+4)}{\cancel{(3x+2)}\cancel{(3x-2)}}$

$= \frac{9x^2-6x+4}{x-5}$

Cevap: B

12. $\left(\frac{6}{x+3} - \frac{3}{x}\right)\left(3 + \frac{x^2+9}{x-3}\right)$

$= \frac{6x-3x-9}{x^2+3x} \cdot \frac{3x-9+x^2+9}{x-3}$

$= \frac{3\cancel{(x-3)}}{\cancel{x^2+3x}} \cdot \frac{\cancel{3x+x^2}}{\cancel{x-3}}$

$= 3$ bulunur.

Cevap: C

13. $\dfrac{(a-b)^2(c-a)-(a-c)^2(b-a)}{a^2-ab-ac+bc}$

$(a-b)^2=(b-a)^2$ ve $(a-c)^2=(c-a)^2$

O halde

$=\dfrac{(b-a)(c-a)((b-a)-(c-a))}{a(a-b)-c(a-b)}$

$=\dfrac{(b-a)(c-a).(b-\cancel{a}-c+\cancel{a})}{(a-b)(a-c)}$

$=\dfrac{\overset{-1}{\cancel{(b-a)}}\overset{-1}{\cancel{(c-a)}}.(b-c)}{\cancel{(a-b)}\cancel{(a-c)}}$

$=b-c$ bulunur.

Cevap: B

14. $x=(1+2^4)(1+2^8)(1+2^{16})$

$(1-2^4).x=\underbrace{(1-2^4).(1+2^4)}(1+2^8).(1+2^{16})$

$(1-16).x=(1-2^8)(1+2^8).(1+2^{16})$

$-15x=(1-2^{16}).(1+-2^{16})$

$-15x=1-2^{32}$

$2^{32}=1+15x$ bulunur.

Cevap: D

15. $\dfrac{a^3+b^3+3ab(a+b)-1}{a^2+b^2+2ab+a+b+1}$

$=\dfrac{(a+b)^3-1}{(a+b)^2+a+b+1}$

$=\dfrac{(a+b-1)\cancel{((a+b)^2+a+b+1)}}{\cancel{((a+b)^2+a+b+1)}}$

$=a+b-1$ bulunur.

Cevap: C

16. $\dfrac{8xy-2x^2y^2}{2-(xy)^{\frac{1}{2}}}=\dfrac{2xy+(xy)^{\frac{3}{2}}}{K}$

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

$\dfrac{2xy\cancel{(2-\sqrt{xy})}(2+\sqrt{xy})}{\cancel{2-\sqrt{xy}}}=\dfrac{2xy+\sqrt{(xy)^3}}{K}$

$K=\dfrac{\cancel{2xy+\sqrt{(xy)^3}}}{2\cancel{\left(2xy+\sqrt{(xy)^3}\right)}}$

$K=\dfrac{1}{2}$ bulunur.

Cevap: B

17. $\dfrac{A}{B}=\dfrac{\dfrac{a^4-81}{a^2}}{\dfrac{(a^2-9)(a^2-1)}{a^2}}=81$

$\Rightarrow \dfrac{\cancel{(a^2-9)}\cancel{(a^2+9)}}{a^2.\cancel{(a^2-9)}\cancel{(a^2-1)}}\cdot\dfrac{\cancel{a^2-1}}{a^2.\cancel{(a^2+9)}}=81$

$\dfrac{1}{a^4}=81 \Rightarrow a^4=\dfrac{1}{81}$

$a^4=\left(\dfrac{1}{3}\right)^4$

$a=\dfrac{1}{3}$ bulunur.

Cevap: A

18. $(x-2)\left(1-\frac{4}{x+2}\right)\cdot\left(3+\frac{12}{x-2}\right)$

$= (x-2)\left(\frac{x+2-4}{x+2}\right)\cdot\left(\frac{3x-6+12}{x-2}\right)$

$= (x-2)\cdot\frac{\cancel{(x-2)}}{\cancel{x+2}}\cdot\frac{3\cancel{(x+2)}}{\cancel{x-2}}$

$= 3(x-2)$

$= 3x-6$

Cevap: B

19. $\frac{(a+b)^2-ab}{a^3-b^3}$ $\quad a-b=5$ ise

$= \frac{a^2+b^2+2ab-ab}{(a-b)(a^2+ab+b^2)}$

$= \frac{\cancel{a^2+b^2+ab}}{(a-b)\cancel{(a^2+b^2+ab)}}$

$= \frac{1}{a-b}$

$= \frac{1}{5}$

Cevap: D

20. $x-\frac{2}{x}=A$ olsun $\quad x^2+\frac{4}{x^2}=29$

$\left(x-\frac{2}{x}\right)^2=A^2$

$\underbrace{x^2+\frac{4}{x^2}}_{29}-4=A^2$

$25=A^2$

$A=5$

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

$\frac{x^2-2}{x}=5 \Rightarrow x^2-2=5x$

$x^2-5x=2$ bulunur.

Cevap: B