1. $\dfrac{(3,45)^2 - (2,55)^2}{(1,15)^2 - (0,65)^2}$ iki kare fark açılımı yaparsak;

$$= \dfrac{(3,45 - 2,55) \cdot (3,45 + 2,55)}{(1,15 - 0,65) \cdot (1,15 + 0,65)}$$

$$= \dfrac{(0,90) \cdot (6)}{(0,50) \cdot (1,80)} = \dfrac{5,4}{0,9}$$

$$= \dfrac{54}{9} = 6$$

CEVAP: B

2. $\sqrt{1905 \cdot 1917 + 36}$

$1905 = x$ olsun.

$$\sqrt{1905 \cdot 1917 + 36} = \sqrt{x \cdot (x + 12) + 36}$$

$$= \sqrt{x^2 + 12x + 36}$$

$$= \sqrt{(x + 6)^2}$$

$$= |x + 6|$$

$$= |1905 + 6|$$

$$= |1911|$$

$$= 1911$$

CEVAP: D

3. $\sqrt{2007 \cdot 2010 - 2006 \cdot 2011}$

$2007 = x$ olsun.

$$= \sqrt{x \cdot (x + 3) - (x - 1) \cdot (x + 4)}$$

$$= \sqrt{x^2 + 3x - (x^2 + 3x - 4)}$$

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

$$= \sqrt{4}$$

$$= 2$$

CEVAP: D

4. $\sqrt{\dfrac{49}{25} - \dfrac{28}{15} + \dfrac{4}{9}} = \sqrt{\left(\dfrac{7}{5}\right)^2 - 2 \cdot \dfrac{7}{5} \cdot \dfrac{2}{3} + \left(\dfrac{2}{3}\right)^2}$

$$= \sqrt{\left(\dfrac{7}{5} - \dfrac{2}{3}\right)^2}$$

$$= \left|\dfrac{7}{5} - \dfrac{2}{3}\right|$$

$$= \left|\dfrac{11}{15}\right|$$

$$= \dfrac{11}{15}$$

CEVAP: D

5. $7^8 - 1 = (7^4)^2 - 1^2$

$$= (7^4 - 1)(7^4 + 1)$$

$$= ((7^2)^2 - 1^2)(7^4 + 1)$$

$$= (7^2 - 1)(7^2 + 1)(7^4 + 1)$$

$$= 48 \cdot 50 \, (7^4 + 1)$$

48 den 12 çarpanı

48, 50 den 20 çarpanı

$48 \cdot 50 \cdot (7^4 + 1)$ den 64 çarpanı

$48 \cdot 50$ den 100 çarpanı elde edilir.

Bu çarpanlardan $11 \cdot 2$ elde edilemez.

CEVAP: B

6. $25^x - 9^x = 544$, $3^x + 5^x = 34$

$$25^x - 9^x = 544$$

$$(5^x)^2 - (3^x)^2 = 544$$

$$(5^x - 3^x) \cdot (5^x + 3^x) = 544$$

$$(5^x - 3^x) \cdot 34 = 544$$

$$5^x - 3^x = 16$$

$$x = 2 \text{ ise}$$

$$5^2 - 3^2 = 25 - 9 = 16 \text{ dır.}$$

O halde $x = 2$ dir.

CEVAP: B

7. $x^2 - y^2 = 13$

$(x - y) \cdot (x + y) = 13 \cdot 1$

x ve y birer pozitif tam sayı, 13 asal olduğundan

$\quad x - y = 1$

$\quad x + y = 13$ olmalıdır.

Ortak çözüm yaparsak

$\quad 2x = 14$

$\quad\quad x = 7$

$\quad\quad y = 6$ bulunur.

$x^3 + y^3 = 7^3 + 6^3 = 343 + 216$

$\quad\quad\quad\quad\quad = 559$

CEVAP: B

8. $a^2 - b^2 = (a - b) \cdot (a + b)$ dir.

a ve b nin değerlerini yerine koyarsak

$a^2 - b^2 = \left(3^{10} + 3^{-10} - 3^{10} + 3^{-10}\right) \cdot \left(3^{10} + 3^{-10} + 3^{10} - 3^{-10}\right)$

$\quad = (2 \cdot 3^{-10}) \cdot (2 \cdot 3^{10})$

$\quad = 4 \cdot 3^{-10} \cdot 3^{10}$

$\quad = 4 \cdot 3^0$

$\quad = 4 \cdot 1$

$\quad = 4$

CEVAP: C

9. $(a - b + c)^2 - (a + b - c)^2$ ifadeye iki kare fark açılımı uygularsak;

$=$

$(\not{a} - b + c - \not{a} - b + c) \cdot (a - b + c + a + b - c)$

$= (-2b + 2c) \cdot 2a$

$= 2(-b + c) \cdot 2a$

$= 4a \cdot (c - b)$

CEVAP: C

10. $a \cdot b = 10$

$(a + b)^2 - (a - b)^2 = a^2 + 2ab + b^2 - (a^2 - 2ab + b^2)$

$\quad\quad = a^2 + 2ab + b^2 - a^2 + 2ab - b^2$

$\quad\quad = 4ab \quad , \quad (a \cdot b = 10)$

$\quad\quad = 4 \cdot 10$

$\quad\quad = 40$

CEVAP: E

11. $x^3 + y^3 = (x + y)^3 - 3xy(x + y)$ dir.

$x^3 + y^3 = (6)^3 - 3 \cdot 4 \cdot 6$

$\quad\quad = 216 - 72$

$\quad\quad = 144$

CEVAP: E

12. $3x - 2y = 0 \Rightarrow 3x = 2y$

$\dfrac{6x^2 + 8xy}{x^2 - 2xy} = \dfrac{2\not{x}(3x + 4y)}{\not{x}(x - 2y)}$

$\quad\quad = \dfrac{2 \cdot (3x + 4y)}{x - 2y}, \quad (3x = 2y)$

$\quad\quad = \dfrac{2 \cdot (2y + 4y)}{x - 2y}, \quad (x = \dfrac{2y}{3})$

$\quad\quad = \dfrac{2 \cdot 6y}{\dfrac{2y}{3} - 2y}$

$\quad\quad = \dfrac{12y}{\dfrac{-4y}{3}}$

$\quad\quad = 12y \cdot \dfrac{3}{-4y}$

$\quad\quad = -9$

CEVAP: A

13.

$$\frac{x^2 - y^2 - 6x + 6y}{2x + 2y - 12} = 5$$

$$\frac{(x-y).(x+y) - 6(x-y)}{2(x+y-6)} = 5$$

$$\frac{(x-y).\cancel{(x+y-6)}}{2.\cancel{(x+y-6)}} = 5$$

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

$$x - y = 10$$

CEVAP: D

14. 1499 = x olsun

$$= x^3 - \underbrace{(x-1) \cdot (x^2 + x + 1)}_{\text{küpler farkının açılımı}}$$

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

$$= \cancel{x^3} - \cancel{x^3} + 1$$

$$= 1$$

CEVAP: C

15. 2009 = x olsun.

$$\frac{x^3 - 1}{x^2 + (x+1)} = \frac{x^3 - 1^3}{x^2 + x + 1}$$

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

$$= x - 1$$

$$= 2009 - 1$$

$$= 2008$$

CEVAP: A

16. $x^2 - 6x - 1 = 0$ ifadesinde her terimi x e bölelim.

$$\frac{x^2}{x} - \frac{6x}{x} - \frac{1}{x} = \frac{0}{x}$$

$$x - 6 - \frac{1}{x} = 0$$

$$x - \frac{1}{x} = 6 \text{ kare alalım}$$

$$\left(x - \frac{1}{x}\right)^2 = 6^2$$

$$x^2 - 2 \cdot x \cdot \frac{1}{x} + \frac{1}{x^2} = 36$$

$$x^2 - 2 + \frac{1}{x^2} = 36$$

$$x^2 + \frac{1}{x^2} = 38$$

CEVAP: D

17. $\frac{1}{a} + a = 4\sqrt{3}$

her iki tarafın karesini alalım.

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

$$\frac{1}{a^2} + 2 \cdot \frac{1}{\cancel{a}} \cdot \cancel{a} + a^2 = 48$$

$$\frac{1}{a^2} + 2 + a^2 = 48$$

$$\frac{1}{a^2} + a^2 = 46$$

CEVAP: B

18.

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

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

$$x - \frac{1}{x} = 2 \text{ dir.}$$

her iki tarafın karesini alalım.

$$\left(x - \frac{1}{x}\right)^2 = 2^2$$

$$x^2 - 2 \cdot x \cdot \frac{1}{x} + \frac{1}{x^2} = 4$$

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

$$x^2 + \frac{1}{x^2} = 6$$

CEVAP: C

19.

$$\underbrace{(2^x - 1) \cdot (2^x + 1)} \cdot (4^x + 1) \cdot (16^x + 1) = 63$$

$$\underbrace{(4^x - 1) \cdot (4^x + 1)} \cdot (16^x + 1) = 63$$

$$(16^x - 1) \cdot (16^x + 1) = 63$$

$$256^x - 1 = 63$$

$$256^x = 64$$

$$2^{8x} = 64$$

$$2^{8x} = 2^6 \Rightarrow 8x = 6$$

$$x = \frac{6}{8}$$

$$x = \frac{3}{4}$$

CEVAP: B

20. $x^2 + 4x + 9 = 0 \quad x^2 + 4x = -9$

$$\underbrace{x^2 + 4x}_{-9} + 16 + \frac{16}{\underbrace{x^2 + 4x}_{-9} + 13} = -9 + 16 + \frac{16}{-9 + 13}$$

$$= 7 + \frac{16}{4}$$

$$= 7 + 4$$

$$= 11$$

CEVAP: E