

به نام خدا

۱- حاصل عبارات زیر را به کمک اتحادها به دست آورید.

الف) $(2x + \frac{1}{x})^2 = 4x^2 + 2x + \frac{1}{x^2}$

ب) $(3x - 4y)^2 = 9x^2 - 24xy + 16y^2$

پ) $(x^2 - x)^2 = x^4 - 2x^3 + x^2$

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

ث) $(3x - 2y + 5)^2 = 9x^2 + 4y^2 + 25 - 12xy + 30x - 20y$

ج) $(x^2 - x + 2)^2 = x^4 + x^2 + 4 - 2x^3 + 4x^2 - 4x$

ح) $(x - y + 3)^2 = x^2 + y^2 + 9 - 2xy - 2y + 6x$

ز) $(\sqrt{2} + 2\sqrt{3})^2 = 2 + 4\sqrt{6} + 12 = 14 + 4\sqrt{6}$

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

۲- عبارات زیر را تجزیه کنید.

الف) $4x^2 - 12x + 9 = (2x-3)^2$

ب) $x^2 - 4x + 4 = (x-2)^2$

پ) $x^4 + 12x^2 + 36 = (x^2 + 6)^2$

ت) $a(x-1) + b(x-1)^2 = (x-1)(a + b(x-1)) = (x-1)(a + bx - b)$

ث) $4x^3 + 12x^2 + 9x = 3x(x^2 + 4x + 3)$

ج) $x^2 + 9a^2 - 12a + 4x - 4ax + 4 = (x - 3a + 2)^2$

$$ج) a^r + b^r + y^r + r ay + r by + rab = (a+b+y)^r$$

$$ح) ra^r + rax + x^r = (ra+x)^r$$

$$خ) x^r - rx^r yz + y^r z^r = (x-yz)^r$$

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$$1) (y-1)(y+1) = y^2 - 1$$

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

$$3) (\sqrt{rx^r+1}-rx)(\sqrt{rx^r+1}+rx) = rx^{\frac{r}{2}+1} - rx^{\frac{r}{2}} = 1$$

$$4) (x-y-z)(x+y+z) = (x-(y+z))(x+(y+z)) = x^2 - (y+z)^2$$

$$5) (a+b-1)(a+1-b) = (a+(b-1))(a-(b-1)) = a^2 - (b-1)^2$$

$$6) (ry - yz)(ry^r + yz^r) \left(\frac{y}{r} z + y \right) = r \left(y - \frac{y}{r} z \right) \left(\frac{y}{r} z + y \right) (ry^r + yz^r) = r \left(y^2 \cdot \frac{y}{r} z \right) (ry^r + yz^r) = 14y^4 - 11z^4$$

$$7) (\sqrt{10} + \sqrt{11})^{10} \times (\sqrt{11} - \sqrt{10})^{11} = (\sqrt{10} + \sqrt{11})^{10} (\sqrt{11} - \sqrt{10})^{10} (\sqrt{11} - \sqrt{10}) = (11-10)^{10} (\sqrt{11} - \sqrt{10}) = \sqrt{11} - \sqrt{10}$$

$$8) \sqrt{r-\sqrt{r}} \times \sqrt{r+\sqrt{r}} = \sqrt{r^2 - r} = \sqrt{r}$$

$$9) (b^{\frac{a}{r}} - \frac{r}{r} a) (b^{\frac{a}{r}} + \frac{r}{r} a) = b^{10} - \frac{9}{14} a^2$$

۲- تجربہ پسند

$$1) x^r - rax = x(x^r - ra) = x(x-a)(x+a)$$

$$2) 9ab^r - 901a = a(9b^r - 901) = a(rb - 01)(rb + 01)$$

$$3) \frac{ra^r}{r} - \frac{ra}{11br} = \left(\frac{ra^r}{r} - \frac{ra}{11br} \right) \left(\frac{ra^r}{r} + \frac{ra}{11br} \right)$$

$$4) rx^{\frac{a}{r}} - \sqrt{a}x = rx(x^{\frac{r}{r}} - \frac{a}{r}) = rx(x^r - \frac{a}{r})(x^r + \frac{a}{r})$$

$$5) (a-rb)^r - (ra+b)^r = (a-rb - (ra+b))(a-rb + ra+b) = (-a-rb)(ra-b)$$

$$6) x^r - y^r + rx + r = (x+r)^r - y^r = (x+r-y)(x+r+y)$$

$$7) -y^{1r} + (\sqrt{m+r})^r = (\sqrt{m+r} - y^r)(\sqrt{m+r} + y^r)$$