1. $5ab^2-\left(\frac{1}{2}ab^2+ab^2\right)-\frac{3}{4}ab^2=5ab^2-\frac{3}{2}ab^2-\frac{3}{4}ab^2=\frac{20-6-3}{4}ab^2=\frac{11}{4}ab^2$

2. $\frac{7}{3}t^2y-t^2\left(3y-\frac{1}{2}y\right)+\left(-\frac{1}{6}t^2y\right)=\frac{7}{3}t^2y-3t^2y+\frac{1}{2}t^2y-\frac{1}{6}t^2y=$

   $=\frac{14-18+3-1}{6}t^2y=-\frac{1}{3}t^2y$

3. $(-5ab)^2\cdot(-ab)+(-14a^3b^3)-(-10a^3b^3)=25a^2b^2\cdot(-ab)-14a^3b^3+10a^3b^3=$

   $=-25a^3b^3-14a^3b^3+10a^3b^3=-29a^3b^3$

4. $\left(\frac{1}{4}ab-\frac{1}{6}ab\right)\cdot\left(-3a+\frac{1}{2}a\right)+\frac{5}{12}a^2b=\left(\frac{1}{12}ab\right)\cdot\left(-\frac{5}{2}a\right)+\frac{5}{12}a^2b=$

   $=-\frac{5}{24}a^2b+\frac{5}{12}a^2b=\frac{-5+10}{24}a^2b=\frac{5}{24}a^2b$

5. $\frac{5}{3}x^3z\cdot\left(-\frac{3}{2}x^3z^2\right)+\frac{14}{5}x^8z^9:\left(2x^2z^6-\frac{13}{10}x^2z^6\right)=-\frac{5}{2}x^6z^3+\frac{14}{5}x^8z^9:\left(\frac{7}{10}x^2z^6\right)=$

   $=-\frac{5}{2}x^6z^3+4x^6z^3=\frac{-5+8}{2}x^6z^3=\frac{3}{2}x^6z^3$

6. $\left[\frac{1}{2}x^3y^4\cdot\left(-\frac{2}{3}xy^2\right):(2x^3y^3)\right]^2=\left[-\frac{1}{3}x^4y^6:(2x^3y^3)\right]^2=\left[-\frac{1}{6}xy^3\right]^2=\frac{1}{36}x^2y^6$

7. $\left[\left(-mn+\frac{5}{6}mn\right)-\frac{mn}{3}+\frac{mn}{2}\right]\cdot(-2m)=\left[-\frac{1}{6}mn-\frac{mn}{3}+\frac{mn}{2}\right]\cdot(-2m)=$

   $=\left[\frac{-1-2+3}{6}mn\right]\cdot(-2m)=0\cdot(-2m)=0$

8. $\frac{a^3b}{2}-\frac{1}{4}a(-a^2b)-\left[\left(-7a+\frac{1}{2}a\right)\cdot(-a^2b+2a^2b)\right]=$

   $=\frac{a^3b}{2}+\frac{1}{4}a^3b-\left[\left(-\frac{13}{2}a\right)\cdot(a^2b)\right]=\frac{a^3b}{2}+\frac{1}{4}a^3b+\frac{13}{2}a^3b=\frac{2+1+26}{4}a^3b=\frac{29}{4}a^3b$

9. $[a^2(b+3b)+2b(a^2-6a^2)]:(3a^2)=[a^2(4b)+2b(-5a^2)]:(3a^2)=$

   $=[4a^2b-10a^2b]:(3a^2)=-6a^2b:(3a^2)=-2b$

10. $[(xy^2)^3x^2]^4:\left(-2x^3y\cdot\frac{1}{3}x^4y^3\right)^2:(xy^4)^4=[x^3y^6x^2]^4:\left(-\frac{2}{3}x^7y^4\right)^2:x^4y^{16}=$

    $=x^{20}y^{24}:\left(\frac{4}{9}x^{14}y^8\right):x^4y^{16}=\frac{9}{4}x^6y^{16}:x^4y^{16}=\frac{9}{4}x^2$

11. $\left[\frac{1}{2}x^3y\cdot(-2xy)\cdot\left(-\frac{3}{5}x^2y^3\right)^2\right]:\left(\frac{3}{5}x^3y^2\right)^2=\left[-x^4y^2\cdot\left(\frac{9}{25}x^4y^6\right)\right]:\left(\frac{9}{25}x^6y^4\right)=$

$=\left(-\frac{9}{25}x^8y^8\right):\left(\frac{9}{25}x^6y^4\right)=-x^2y^4$

12. $3ab^2\cdot 2b(-5ab)+2b^2\left[-\frac{1}{4}ab+\frac{3}{2}a\left(-\frac{1}{2}b\right)\right]^2=-30a^2b^4+2b^2\left[-\frac{1}{4}ab-\frac{3}{4}ab\right]^2=$

$=-30a^2b^4+2b^2(a^2b^2)=-30a^2b^4+2a^2b^4=-28a^2b^4$

13. $(a+2a)^2b^3-b(4ab)^2+a^5b^6:(a^3b^3)=(3a)^2b^3-b(16a^2b^2)+a^2b^3=$

$=9a^2b^3-16a^2b^3+a^2b^3=-6a^2b^3$

14. $\frac{1}{2}\{4a^2b^3y-3a[4a^5b^7y:(2a^4b^4)]\}^2:[3a^4b^3-2b(a^2b)^2]=$

$=\frac{1}{2}\{4a^2b^3y-3a[2ab^3y]\}^2:[3a^4b^3-2b(a^4b^2)]=$

$=\frac{1}{2}\{4a^2b^3y-6a^2b^3y\}^2:[3a^4b^3-2a^4b^3]=$

$=\frac{1}{2}\{-2a^2b^3y\}^2:(a^4b^3)=\frac{1}{2}\cdot 4a^4b^6y^2:(a^4b^3)=2a^4b^6y^2:(a^4b^3)=2b^3y^2$

15. $[6a^4b^6:(-2ab^3)+(ab)^3]^2-[-2a^2\cdot(-ab^2)\cdot(a^3b^7):b^3]=$

$=[-3a^3b^3+a^3b^3]^2-[2a^3b^2\cdot(a^3b^7):b^3]=[-2a^3b^3]^2-[2a^6b^9:b^3]=$

$=4a^6b^6-2a^6b^6=2a^6b^6$

16. $[x^3y^6:(2x)]^3:\left\{3\cdot\left[\frac{1}{2}x^3y^8-\frac{1}{3}xy^4\cdot(xy^2)^2\right]^2\right\}=$

$=\left[\frac{1}{2}x^2y^6\right]^3:\left\{3\cdot\left[\frac{1}{2}x^3y^8-\frac{1}{3}xy^4\cdot(x^2y^4)\right]^2\right\}=$

$=\frac{1}{8}x^6y^{18}:\left\{3\cdot\left[\frac{1}{2}x^3y^8-\frac{1}{3}x^3y^8\right]^2\right\}=\frac{1}{8}x^6y^{18}:\left\{3\cdot\left[\frac{1}{6}x^3y^8\right]^2\right\}=$

$=\frac{1}{8}x^6y^{18}:\left\{3\cdot\frac{1}{36}x^6y^{16}\right\}=\frac{1}{8}x^6y^{18}:\left\{\frac{1}{12}x^6y^{16}\right\}=\frac{3}{2}y^2$

17. $3a^3x^6-2a\cdot(a^3x^4)^2:(a^2x)^2-a\cdot(a^2x^5-3a^2x^5)\cdot x=$

$=3a^3x^6-2a\cdot(a^6x^8):(a^4x^2)-a\cdot(-2a^2x^5)\cdot x=$

$=3a^3x^6-2a^7x^8:(a^4x^2)+2a^3x^5\cdot x=3a^3x^6-2a^3x^6+2a^3x^6=3a^3x^6$