EduSahara™ Assignment

Name : Simplifying Expressions with Variables

Chapter : Indices

Grade : ICSE Grade IX

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1. $9m^4.8m^7 =$

   (i) $17m^{28}$ (ii) $72m^{11}$ (iii) $11m^{72}$ (iv) $72m^{28}$ (v) $17m^{11}$

2. $7k^4.2k^2.9k^3 =$

   (i) $126k^9$ (ii) $126k^{24}$ (iii) $18k^9$ (iv) $9k^{126}$ (v) $18k^{24}$

3. $6v^6.4v^4.2v^7.7v^8 =$

   (i) $17v^{168}$ (ii) $17v^{17}$ (iii) $17v^{192}$ (iv) $168v^{192}$ (v) $336v^{25}$

4. $-6x^7.-9x^{(-9)} =$

   (i) $-2x^{54}$ (ii) $-15x^{(-2)}$ (iii) $54x^{(-2)}$ (iv) $54x^{(-63)}$ (v) $-15x^{(-63)}$

5. $-7x^{(-3)}.-4x^4.-6x^6 =$

   (i) $-168x^7$ (ii) $-168x^{(-72)}$ (iii) $-17x^7$ (iv) $-17x^{(-72)}$ (v) $7x^{(-168)}$

6. $-5e^{(-9)}.-6e^5.-7e^{(-6)}.-9e^8 =$

   (i) $1890e^{(-2)}$ (ii) $-20e^{(-10)}$ (iii) $-10e^{(-270)}$ (iv) $-20e^{(-360)}$ (v) $-270e^{(-360)}$

7. Find the square root of $c^2d^6e^4 =$

   (i) $(c^2d^6e^4)^2$ (ii) cd^3e^2 (iii) cde^{12} (iv) cde^{48} (v) $\frac{1}{c^2d^6e^4}$

8. $9s^{(-7)}t^5.-3s^{(-2)}t^{(-6)} =$

   (i) $27s^{(-9)}t^{11}$ (ii) $12s^{(-9)}t^{(-1)}$ (iii) $-27s^{(-7)}t^5$ (iv) $-27s^{(-9)}t^{(-1)}$ (v) $6s^{(-9)}t^{(-1)}$

9. $(a^3)^7 =$

   (i) $7a^3$ (ii) a^{10} (iii) a^{21} (iv) a^3 (v) a^4

10. $\frac{f^{19}}{f^3} =$

    (i) f^{22} (ii) $19f^{16}$ (iii) f^{57} (iv) f^{16} (v) $3f^{16}$

11. $(q^2 r^3)^5 =$

(i) $5q^7 r^8$ (ii) $q^{10} r^{15}$ (iii) $5q^{10} r^{15}$ (iv) $q^7 r^8$ (v) $5q^2 r^3$

12. $(-3i^4 j^6)^4 =$

(i) $-3i^{16} j^{24}$ (ii) $-12i^8 j^{10}$ (iii) $-12i^{16} j^{24}$ (iv) $81i^8 j^{10}$ (v) $81i^{16} j^{24}$

13. $\left(\frac{q^{10}}{q^5}\right)^3 =$

(i) q^{150} (ii) q^{45} (iii) q^{15} (iv) $3q^5$ (v) $3q^{15}$

14. $\left(\frac{v^3 w^5}{x^7}\right)^5 =$

(i) $\left(\frac{v^8 w^{10}}{x^{12}}\right)$ (ii) $\left(\frac{v^{15} w^{25}}{x^{35}}\right)$ (iii) $\left(\frac{v^{15} w^{25}}{x^{12}}\right)$ (iv) $\left(\frac{v^8 w^{10}}{x^{35}}\right)$ (v) $\left(\frac{5v^3 w^5}{5x^7}\right)$

15. $\frac{r^{10} s^{17}}{r^8 s^8} =$

(i) $r^2 s^{25}$ (ii) $r^{18} s^{25}$ (iii) $r^2 s^9$ (iv) $r^{27} s^{16}$ (v) $r^{18} s^9$

16. $\frac{g^7}{g^{18}} =$

(i) $\frac{1}{g^{11}}$ (ii) $\frac{1}{g^{(-11)}}$ (iii) g^{11} (iv) $\frac{1}{g^{25}}$ (v) $\frac{1}{g^{126}}$

17. $(d^4)^{(e+2)} =$

(i) $d^{(4e-8)}$ (ii) $d^{(4e+6)}$ (iii) $d^{(e+12)}$ (iv) $d^{(4e+8)}$ (v) $d^{(e+10)}$

18. $\left(\frac{g^2}{h^4}\right)^k =$

(i) $g^{2k}.h^{4k}$ (ii) $\frac{g^{2k}}{h^{4k}}$ (iii) $\frac{h^{4k}}{g^{2k}}$ (iv) $g^{2k}.-h^{4k}$

19. $\left(\frac{f^{(-5h+3)}}{f^{(-6h+4)}}\right) =$

(i) $f^{(-11h+7)}$ (ii) f^h (iii) $f^{(-36h^2-99h-58)}$ (iv) $f^{(h-1)}$ (v) $f^{(-7h-19)}$

20. $\left(\frac{a^9}{a^4}\right)^6 =$

(i) a^{13} (ii) a^{30} (iii) a^9 (iv) a^4 (v) $6a^{30}$

21. $\left(a^{14a}\right)^6 =$

(i) $6a^{84a}$ (ii) a^{84a} (iii) $a^{(14a+6)}$ (iv) a^{14a}

22. $\left(b^{(-4)}.c^{(-3)}\right)^{-2} =$

(i) $b^{(-2)}.c^{(-1)}$ (ii) $b^8.c^9$ (iii) $b^{(-6)}.c^{(-5)}$ (iv) $b^8.c^6$ (v) $b^{12}.c^6$

23. $\left((r^4)^{(-4)}\right)^{-8} =$

(i) $r^{(-24)}$ (ii) $r^{(-8)}$ (iii) r^{16} (iv) r^{128}

24. $\left(4t^3.u^{(-2)}\right)^{-1} =$

(i) $u^2.4t^{(-3)}$ (ii) $\frac{-4u^2}{-t^{(-3)}}$ (iii) $\frac{u^2}{4t^3}$ (iv) $\frac{t^2}{4u^{(-3)}}$ (v) $\frac{4u^2}{t^{(-3)}}$

25. $(j-k)^3.(j-k)^2 =$

(i) $(j-k)^2$ (ii) $(j-k)^6$ (iii) $(j-k)^3$ (iv) $(j-k)^5$ (v) $(j-k)$

26. $\left(\frac{3x^6}{3y^2}\right)^{-4} =$

(i) $\frac{81x^{(-24)}}{81y^2}$ (ii) $\frac{81x^{(-24)}}{81y^{(-8)}}$ (iii) $\frac{81x^2}{81y^{(-2)}}$ (iv) $\frac{81y^8}{81x^{24}}$

27. $\sqrt{\frac{k^4}{4l^4}} =$

(i) $\frac{2k^2}{l^2}$ (ii) $\frac{k^2}{2l^2}$ (iii) $\frac{k^8}{2l^8}$ (iv) $\frac{l^2}{2k^2}$ (v) $\frac{k^4}{2l^4}$

28. Find the square root of $\frac{k^{14}l^4}{4m^6}$

(i) $\frac{k^7l^2}{2m^3}$ (ii) $\frac{k^{14}l^4}{2m^6}$ (iii) $\frac{k^{14}l^2}{2m^3}$ (iv) $\frac{k^7l^4}{2m^3}$ (v) $\frac{k^7l^2}{2m^6}$

29. Find the square root of $\frac{f^4}{9g^2}$

(i) $\frac{f^2}{3g}$ (ii) $\frac{f^2}{3g^2}$ (iii) $\frac{f^4}{3g^2}$ (iv) $\frac{f^8}{3g^4}$ (v) $\frac{f^4}{3g}$

30. $\frac{g^{(-2)}}{6k^{(-10)}} =$

(i) $\frac{k^{(-10)}}{6g^{(-2)}}$ (ii) $\frac{6k^{10}}{g^2}$ (iii) $\frac{6k^{(-10)}}{g^{(-2)}}$ (iv) $\frac{g^{10}}{6k^2}$ (v) $\frac{k^{10}}{6g^2}$

31. Which of the following statements are true?

a) $\left(x^m\right)^n = x^{(m+n)}$

b) $a^m . a^n = a^{mn}$

c) $\frac{x^m}{x^n} = x^{\frac{m}{n}}$

d) $a . x^m = a^m . x^m$

e) $a^0 = 1 \ (a \neq 0)$

f) $\left(x^m\right)^n = \left(x^n\right)^m$

(i) {a,e} (ii) {c,d,e} (iii) {e,f} (iv) {a,f,e} (v) {b,f}

32. Simplify $\left(\frac{w^k}{w^l}\right)^{(k+l)} \left(\frac{w^l}{w^m}\right)^{(l+m)} \left(\frac{w^m}{w^k}\right)^{(m+k)}$

(i) $w^{(k+l+m)}$ (ii) -1 (iii) 1 (iv) w (v) 0

33. Simplify $\left(z^g\right)^{(h-i)} \left(z^h\right)^{(i-g)} \left(z^i\right)^{(g-h)}$

(i) z (ii) -1 (iii) 1 (iv) 0 (v) $z^{(g+h+i)}$

34. Simplify $\left(x^{(h+i)}\right)^{(h-i)} \left(x^{(i+j)}\right)^{(i-j)} \left(x^{(j+h)}\right)^{(j-h)}$

(i) -1 (ii) 1 (iii) x (iv) 0 (v) $x^{(h+i+j)}$

35. Simplify $\left(\frac{z^n}{z^o}\right)^p \left(\frac{z^o}{z^p}\right)^n \left(\frac{z^p}{z^n}\right)^o$

(i) $z^{(n+o+p)}$ (ii) 0 (iii) -1 (iv) 1 (v) z

36. Simplify $\dfrac{\left(z^{(k+l)}\right)^6\left(z^{(l+m)}\right)^6\left(z^{(m+k)}\right)^6}{\left(z^k.z^l.z^m\right)}$

(i) $z^{(6k+6l+6m)}$ (ii) $z^k.z^l.z^m$ (iii) $z^{(5k+5l+5m)}$ (iv) $z^{(12k+12l+12m)}$ (v) $z^{(11k+11l+11m)}$

37. Simplify $\left(\dfrac{6^m.49^{(m-5)}.64^{(m-3)}}{36^{(m-5)}.7^{(m-3)}.8^{(m-5)}}\right)$

(i) $6^{(-m+10)}.7^{(m-7)}.8^{(m-1)}$ (ii) $6^{(-m+10)}.7^{(-m+1)}.8^{(-m+7)}$ (iii) $6^5.7^{(-2)}.8^2$

(iv) $6^{(m+5)}.7^{(-m+1)}.8^{(-m+7)}$

38. If $d^{\frac{1}{3}}+e^{\frac{1}{3}}+f^{\frac{1}{3}}=0$, then

(i) $(d+e+f)=3def$ (ii) $(d+e+f)=3d^{\frac{1}{3}}e^{\frac{1}{3}}f^{\frac{1}{3}}$ (iii) $(d+e+f)=27def$ (iv) $(d+e+f)^3=27def$

39. Find the square root of $f^{(6x+6)}.g^{6x}.h^{(6x-6)}$

(i) $f^{(3x+3)}.g^{3x}.h^{(3x-3)}$ (ii) $f^{(3x-3)}.g^{3x}.h^{(3x+3)}$ (iii) $f^{(x+3)}.g^{6x}.h^{(x-3)}$

(iv) $6f^{(x+1)}.6g^x.6h^{(x-1)}$

40. $\left(e^5+f^5\right)^0=$

(i) (-1) (ii) e^5+f^5 (iii) 0 (iv) 3 (v) 1

41. Evaluate $\left(j^{\frac{1}{2}}+k^{\frac{1}{2}}\right)\left(j^{\frac{1}{2}}-k^{\frac{1}{2}}\right)=$

(i) $(j+k)$ (ii) $(j+k)^2$ (iii) $(j-k)$ (iv) 0 (v) 1

42. Evaluate $\left(p^{\frac{1}{3}}+q^{\frac{1}{3}}\right)\left(p^{\frac{2}{3}}-p^{\frac{1}{3}}q^{\frac{1}{3}}+q^{\frac{2}{3}}\right)=$

(i) $(p-q)^2$ (ii) $(p+q)^2$ (iii) $p+q$ (iv) $p-q$ (v) 0

43. Evaluate $\left(k^{\frac{1}{3}}-l^{\frac{1}{3}}\right)\left(k^{\frac{2}{3}}+k^{\frac{1}{3}}l^{\frac{1}{3}}+l^{\frac{2}{3}}\right)=$

(i) 0 (ii) $k+l$ (iii) $(k-l)^2$ (iv) $k-l$ (v) $(k+l)^2$

44. $\left(a^{\frac{1}{3}}+b^{\frac{1}{3}}+c^{\frac{1}{3}}\right)\left(a^{\frac{2}{3}}+b^{\frac{2}{3}}+c^{\frac{2}{3}}-a^{\frac{1}{3}}b^{\frac{1}{3}}-b^{\frac{1}{3}}c^{\frac{1}{3}}-c^{\frac{1}{3}}a^{\frac{1}{3}}\right)=$

(i) $(a-b-c)$ (ii) $(a+b+c)^2$ (iii) 0 (iv) $a+b+c-3c^{\frac{1}{3}}a^{\frac{1}{3}}b^{\frac{1}{3}}$ (v) $(a-b-c)^2$

45. $\left(\frac{3}{5}bcd\right)\times\left(4c^{10}d^{7}\right)\times\left(-\frac{7}{9}d^{2}\right)=$

(i) $-\frac{28}{15}bc^{11}d^{10}$ (ii) $\frac{49}{135}d^{10}bc^{3}$ (iii) $\frac{196}{81}c^{12}d^{16}$ (iv) $\frac{12}{5}bc^{11}d^{8}$ (v) $-\frac{28}{15}bc^{13}d^{15}$

46. Evaluate $\left(e^{2}+f^{2}\right)\left(e^{4}-e^{2}f^{2}+f^{4}\right)=$

(i) $e^{6}+2f^{2}e^{4}+2f^{4}e^{2}+f^{6}$ (ii) $e^{6}-f^{6}$ (iii) $e^{6}+f^{6}$ (iv) $e^{6}-2f^{2}e^{4}+2f^{4}e^{2}-f^{6}$ (v) 0

47. Evaluate $\left(f^{2}-1\right)\left(f^{4}+f^{2}+1\right)=$

(i) $f^{6}-1$ (ii) $f^{6}-2f^{2}+1$ (iii) $f^{6}+2f^{4}-1$ (iv) $f^{6}+2f^{4}+2f^{2}+1$ (v) 0

Assignment Key

1) (ii)	2) (i)	3) (v)	4) (iii)	5) (i)	6) (i)
7) (ii)	8) (iv)	9) (iii)	10) (iv)	11) (ii)	12) (v)
13) (iii)	14) (ii)	15) (iii)	16) (i)	17) (iv)	18) (ii)
19) (iv)	20) (ii)	21) (ii)	22) (iv)	23) (iv)	24) (iii)
25) (iv)	26) (iv)	27) (ii)	28) (i)	29) (i)	30) (v)
31) (iii)	32) (iii)	33) (iii)	34) (ii)	35) (iv)	36) (v)
37) (i)	38) (ii)	39) (i)	40) (v)	41) (iii)	42) (iii)
43) (iv)	44) (iv)	45) (i)	46) (iii)	47) (i)	

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