EduSahara™ Assignment

Name : Simplifying Expressions with Variables

Chapter : Indices

Grade : ICSE Grade IX



1. $6f^{7}.9f^{6} =$

(i) $13f^{54}$ (ii) $54f^{42}$ (iii) $54f^{13}$ (iv) $15f^{13}$ (v) $15f^{42}$

2. $6i^{7}.2i^{8}.3i^{7} =$

(i) $22i^{36}$ (ii) $11i^{22}$ (iii) $36i^{22}$ (iv) $11i^{392}$ (v) $36i^{392}$

3. $5h^{5}.6h^{9}.3h^{6}.7h^{9} =$

(i) $20h^{210}$ (ii) $18h^{405}$ (iii) $210h^{405}$ (iv) $630h^{29}$ (v) $18h^{20}$

4. $-9m^{3}.-2m^{4} =$

(i) $18m^{12}$ (ii) $-11m^{12}$ (iii) $7m^{18}$ (iv) $18m^{7}$ (v) $-11m^{7}$

5. $-9q^{6}.-3q^{3}.-7q^{(-5)} =$

(i) $-189q^{4}$ (ii) $-19q^{4}$ (iii) $-189q^{(-90)}$ (iv) $-19q^{(-90)}$ (v) $4q^{(-189)}$

6. $-3m^{(-9)}.-6m^{(-3)}.-2m^{(-4)}.-4m^{(-3)} =$

(i) $-13m^{(-81)}$ (ii) $144m^{(-19)}$ (iii) $-72m^{(-81)}$ (iv) $-16m^{(-72)}$ (v) $-13m^{(-16)}$

7. Find the square root of $q^{2}r^{6}s^{4} =$

(i) $\frac{1}{q^{2}r^{6}s^{4}}$ (ii) $qrs^{12}$ (iii) $qr^{3}s^{2}$ (iv) $qrs^{48}$ (v) $(q^{2}r^{6}s^{4})^{2}$

8. $9r^{(-2)}s^{(-4)}.-2r^{(-2)}s^{4} =$

(i) $-18r^{(-2)}s^{(-4)}$ (ii) $7r^{(-4)}$ (iii) $11r^{(-4)}$ (iv) $-18r^{(-4)}$ (v) $18r^{(-4)}s^{(-8)}$

9. $(v^{3})^{5} =$

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

10. $\frac{h^{10}}{h^{4}} =$

(i) $h^{14}$ (ii) $h^{6}$ (iii) $4h^{6}$ (iv) $10h^{6}$ (v) $h^{40}$

11. $(x^4y^4)^7 =$

(i) $x^{11}y^{11}$ (ii) $x^{28}y^{28}$ (iii) $7x^{11}y^{11}$ (iv) $7x^{28}y^{28}$ (v) $7x^4y^4$

12. $(-4k^2l^2)^4 =$

(i) $-16k^6l^6$ (ii) $-16k^8l^8$ (iii) $256k^6l^6$ (iv) $256k^8l^8$ (v) $-4k^8l^8$

13. $\left(\frac{f^{17}}{f^8}\right)^4 =$

(i) $f^{100}$ (ii) $f^{36}$ (iii) $4f^{25}$ (iv) $f^{544}$ (v) $4f^9$

14. $\left(\frac{h^2i^7}{j^4}\right)^5 =$

(i) $\left(\frac{h^7i^{12}}{j^{20}}\right)$ (ii) $\left(\frac{h^{10}i^{35}}{j^9}\right)$ (iii) $\left(\frac{h^7i^{12}}{j^9}\right)$ (iv) $\left(\frac{h^{10}i^{35}}{j^{20}}\right)$ (v) $\left(\frac{5h^2i^7}{5j^4}\right)$

15. $\frac{d^{12}e^{20}}{d^5e^7} =$

(i) $d^7e^{27}$ (ii) $d^7e^{13}$ (iii) $d^{32}e^{12}$ (iv) $d^{17}e^{27}$ (v) $d^{17}e^{13}$

16. $\frac{w^5}{w^{16}} =$

(i) $\frac{1}{w^{21}}$ (ii) $\frac{1}{w^{80}}$ (iii) $\frac{1}{w^{11}}$ (iv) $w^{11}$ (v) $\frac{1}{w^{(-11)}}$

17. $(w^5)^{(x+4)} =$

(i) $w^{(5x+9)}$ (ii) $w^{(5x-20)}$ (iii) $w^{(5x+20)}$ (iv) $w^{(x+14)}$ (v) $w^{(x+25)}$

18. $\left(\frac{i^7}{j^4}\right)^l =$

(i) $i^{7l}.j^{4l}$ (ii) $\frac{j^{4l}}{i^{7l}}$ (iii) $\frac{i^{7l}}{j^{4l}}$ (iv) $i^{7l}.-j^{4l}$

19. $\left(\frac{s^{(-x+7)}}{s^{(6x-3)}}\right) =$

(i) $s^{(-7x+11)}$ (ii) $s^{(-7x+10)}$ (iii) $s^{(-13x-6)}$ (iv) $s^{(5x+4)}$ (v) $s^{(-12x^2-41x-5)}$

20. $\left(\frac{n^{10}}{n^{6}}\right)^{5} =$

(i) $5\,n^{20}$ (ii) $n^{10}$ (iii) $n^{20}$ (iv) $n^{16}$ (v) $n^{6}$

21. $\left(f^{15f}\right)^{2} =$

(i) $f^{30f}$ (ii) $f^{15f}$ (iii) $2\,f^{30f}$ (iv) $f^{(15f+2)}$

22. $\left(u^{(-2)}.\,v^{(-2)}\right)^{-2} =$

(i) $u^{4}.\,v^{6}$ (ii) $u^{(-4)}.\,v^{(-4)}$ (iii) $u^{6}.\,v^{4}$ (iv) $u^{4}.\,v^{4}$ (v) 1.1

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

(i) $c^{24}$ (ii) $c^{(-11)}$ (iii) $c^{(-5)}$ (iv) $c^{9}$ (v) $c^{(-1)}$

24. $\left(2p.\,q^{(-1)}\right)^{-2} =$

(i) $q^{2}.4\,p^{(-2)}$ (ii) $\frac{2\,q^{2}}{p^{(-2)}}$ (iii) $\frac{-4\,q^{2}}{-2\,p^{(-2)}}$ (iv) $\frac{p^{2}}{4\,q^{(-2)}}$ (v) $\frac{q^{2}}{4\,p^{2}}$

25. $(d+e)^{(-4)}.(d+e)^{4} =$

(i) $(d+e)^{(-16)}$ (ii) $(d+e)^{(-4)}$ (iii) $(d+e)^{4}$ (iv) 1 (v) $(d+e)^{(-8)}$

26. $\left(\frac{4\,i^{2}}{3\,j^{4}}\right)^{-2} =$

(i) $\frac{9\,i^{(-4)}}{16\,j^{4}}$ (ii) $\frac{16\,i^{(-4)}}{9\,j^{(-8)}}$ (iii) $\frac{9}{16\,j^{2}}$ (iv) $\frac{9\,j^{8}}{16\,i^{4}}$ (v) $\frac{16}{9\,j^{2}}$

27. $\sqrt{\frac{16\,v^{4}}{81\,w^{4}}} =$

(i) $\frac{4\,v^{4}}{9\,w^{4}}$ (ii) $\frac{4\,w^{2}}{9\,v^{2}}$ (iii) $\frac{9\,v^{2}}{4\,w^{2}}$ (iv) $\frac{4\,v^{2}}{9\,w^{2}}$ (v) $\frac{4\,v^{8}}{9\,w^{8}}$

28. Find the square root of $\frac{16\,s^{4}\,t^{12}}{25\,u^{10}}$

(i) $\frac{4\,s^{2}\,t^{12}}{5\,u^{5}}$ (ii) $\frac{4\,s^{4}\,t^{6}}{5\,u^{5}}$ (iii) $\frac{4\,s^{2}\,t^{6}}{5\,u^{10}}$ (iv) $\frac{4\,s^{2}\,t^{6}}{5\,u^{5}}$ (v) $\frac{4\,s^{4}\,t^{12}}{5\,u^{10}}$

29. Find the square root of $\frac{4e^{12}}{9f^{10}}$

(i) $\frac{2e^{24}}{3f^{20}}$ (ii) $\frac{2e^{6}}{3f^{10}}$ (iii) $\frac{2e^{6}}{3f^{5}}$ (iv) $\frac{2e^{12}}{3f^{10}}$ (v) $\frac{2e^{12}}{3f^{5}}$

30. $\frac{10r^{(-8)}}{11w^{(-5)}} =$

(i) $\frac{11w^{5}}{10r^{8}}$ (ii) $\frac{11w^{(-5)}}{10r^{(-8)}}$ (iii) $\frac{10r^{5}}{11w^{8}}$ (iv) $\frac{10w^{5}}{11r^{8}}$ (v) $\frac{10w^{(-5)}}{11r^{(-8)}}$

31. Which of the following statements are true?

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

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

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

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

e) $a.x^{m} = a^{m}.x^{m}$

f) $a^{0} = 1 \ (a \neq 0)$

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

32. Simplify $\left(\frac{s^{a}}{s^{b}}\right)^{(a+b)} \left(\frac{s^{b}}{s^{c}}\right)^{(b+c)} \left(\frac{s^{c}}{s^{a}}\right)^{(c+a)}$

(i) 1 (ii) -1 (iii) 0 (iv) $s$ (v) $s^{(a+b+c)}$

33. Simplify $\left(w^{e}\right)^{(f-g)} \left(w^{f}\right)^{(g-e)} \left(w^{g}\right)^{(e-f)}$

(i) $w^{(e+f+g)}$ (ii) 1 (iii) $w$ (iv) -1 (v) 0

34. Simplify $\left(t^{(k+l)}\right)^{(k-l)} \left(t^{(l+m)}\right)^{(l-m)} \left(t^{(m+k)}\right)^{(m-k)}$

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

35. Simplify $\left(\frac{u^{i}}{u^{j}}\right)^{k} \left(\frac{u^{j}}{u^{k}}\right)^{i} \left(\frac{u^{k}}{u^{i}}\right)^{j}$

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

36. Simplify $\frac{\left(w^{(e+f)}\right)^2\left(w^{(f+g)}\right)^2\left(w^{(g+e)}\right)^2}{\left(w^e.w^f.w^g\right)}$

(i) $w^e.w^f.w^g$ (ii) $w^{(3e+3f+3g)}$ (iii) $w^{(4e+4f+4g)}$ (iv) $w^{(e+f+g)}$ (v) $w^{(2e+2f+2g)}$

37. Simplify $\left(\frac{4^h.25^{(h-5)}.36^{(h-5)}}{16^{(h-5)}.5^{(h-5)}.6^{(h-2)}}\right)$

(i) $4^5.5^0.6^{(-3)}$ (ii) $4^{(-h+10)}.5^{(h-5)}.6^{(h-8)}$ (iii) $4^{(h+5)}.5^{(-h+5)}.6^{(-h-1)}$

(iv) $4^{(-h+10)}.5^{(-h+5)}.6^{(-h-1)}$

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

(i) $(f+g+h)=27fgh$ (ii) $(f+g+h)= 3f^{\frac{1}{3}}g^{\frac{1}{3}}h^{\frac{1}{3}}$ (iii) $(f+g+h)=3fgh$ (iv) $(f+g+h)^3=27fgh$

39. Find the square root of $e^{(4x+4)}.f^{4x}.g^{(4x-4)}$

(i) $e^{(2x-2)}.f^{2x}.g^{(2x+2)}$ (ii) $e^{(2x+2)}.f^{2x}.g^{(2x-2)}$ (iii) $4e^{(x+1)}.4f^x.4g^{(x-1)}$

(iv) $e^{(x+2)}.f^{4x}.g^{(x-2)}$

40. $\left(d^8 + e^8\right)^0 =$

(i) 3 (ii) 1 (iii) (-1) (iv) $d^8 + e^8$ (v) 0

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

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

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

(i) 0 (ii) $(m+n)^2$ (iii) $m - n$ (iv) $m + n$ (v) $(m-n)^2$

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

(i) $(n+o)^2$ (ii) $n - o$ (iii) $(n-o)^2$ (iv) 0 (v) $n + o$

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

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

45. $\left(\frac{1}{9}rst\right)\times\left(9s^7t^6\right)\times\left(-\frac{5}{2}t^2\right)=$

(i) $rs^8t^7$ (ii) $\frac{225}{4}s^9t^{14}$ (iii) $-\frac{5}{2}rs^8t^9$ (iv) $-\frac{5}{2}rs^{10}t^{13}$ (v) $\frac{25}{36}t^9rs^3$

46. Evaluate $\left(n^2+o^2\right)\left(n^4-n^2o^2+o^4\right)=$

(i) $n^6-2o^2n^4+2o^4n^2-o^6$ (ii) $n^6+2o^2n^4+2o^4n^2+o^6$ (iii) $n^6+o^6$ (iv) $n^6-o^6$ (v) 0

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

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

## Assignment Key

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