

Indices

Q1. Write down each of these in fraction form.

a 7^{-2}

b 2^{-1}

c 10^{-3}

d 5^{-2}

e 8^{-2}

f 12^{-1}

g s^{-2}

h p^{-1}

i r^{-m}

Q2. Change each of the following expressions into an index form of the type shown.

a all of the form 2^n

i 16

ii $1/2$

iii $1/16$

iv 8^{-1}

b all of the form 10^n

i 1000

ii $1/10$

iii $1/100$

iv 1 million

c all of the form 5^n

i 125

ii $1/5$

iii $1/125$

iv $1/625$

d all of the form 3^n

i 27

ii $1/9$

iii $1/81$

iv -243

Q3. Rewrite each of the following expressions in fraction form.

a $7x^{-3}$

b $3x^{-1}$

c $7p^{-2}$

d $8q^{-4}$

e $10m^{-5}$

f $1/2x^{-3}$

g $1/2 m^{-1}$

h $3/4 t^{-4}$

i $4/5 y^{-3}$

Q4. Find the value of each of the following, where the letters have the given values.

a Where $x = 5$

i x^2

ii x^{-3}

iii $4x^{-1}$

b Where $t = 4$

i t^3

ii t^{-2}

iii $5t^{-4}$

c Where $m = 2$

i m^3

ii m^{-5}

iii $9m^{-1}$

d Where $w = 10$

i w^6

ii w^{-3}

iii $25w^{-2}$

Q5. Write these as single powers of 5.

a $5^2 \times 5^2$

b 5×5^2

c $5^{-2} \times 5^{-4}$

d $5^6 \times 5^{-3}$

Q6. Write these as single powers of 6.

a $6^5 \div 6^2$

b $6^4 \div 6^4$

c $6^4 \div 6^{-2}$

d $6^{-3} \div 6^{-2}$

Q7. Simplify these and write them as single powers of a.

a $a^2 \times a$

b $a^3 \times a^2$

c $a^4 \times a^3$

d $a^6 \div a^2$

e $a^3 \div a$

f $a^5 \div a^4$

Q8. Write these as single powers of 4.

a $(4^2)^3$

b $(4^3)^5$

c $(4^1)^6$

d $(4^3)^{-2}$

e $(4^{-2})^{-3}$

f $(4^7)^0$

Q9. Simplify

a) $\frac{2^5 \times 2^{-2}}{2^2} = \underline{\hspace{2cm}}$

b) $\frac{3^{-4} \times 3^{-5}}{3^{-2}} = \underline{\hspace{2cm}}$

c) $\frac{7^{-5} \times 7^2}{7^4} = \underline{\hspace{2cm}}$

d) $\frac{2^8 \times 2^{-3}}{2^6 \times 2^{-4}} = \underline{\hspace{2cm}}$

e) $\frac{3^8}{3^6 \times 3^{-4}} = \underline{\hspace{2cm}}$

Q10. Simplify the following indices.

a. $(8/27)^{1/3}$

b. $(27/125)^{1/3}$

c. $(144/169)^{1/2}$

Q11. Evaluate the following.

a $32^{4/5}$

b $125^{2/3}$

c $1296^{3/4}$

d $243^{4/5}$

Q12. Evaluate the following.

a $8^{2/3}$

b $27^{2/3}$

c $16^{3/2}$

d $625^{5/4}$

Q13. Evaluate the following.

a $25^{-1/2}$

b $36^{-1/2}$

c $16^{-1/4}$

d $81^{-1/4}$

e $16^{-1/2}$

f $8^{-1/3}$

g $32^{-1/5}$

h $27^{-1/3}$

Q14. Evaluate the following.

a $25^{-3/2}$

b $36^{-3/2}$

c $16^{-3/4}$

d $81^{-3/4}$

e $64^{-4/3}$

f $8^{-2/3}$

g $32^{-2/5}$

h $27^{-2/3}$

Q15. Evaluate the following.

a $100^{-5/2}$

b $144^{-1/2}$

c $125^{-2/3}$

d $9^{-3/2}$

e $4^{-5/2}$

f $64^{-5/6}$

g $27^{-4/3}$

h $169^{-1/2}$

Q16-19. You are given that $x = 7^m$ and $y = 7^p$

Write each of the following as a single power of 7

16. $xy =$ _____

17. $y^2 =$ _____

18. $x/y =$ _____

19. $(xy)^2 =$ _____

Q20 .For $x > 1$, write the following expressions in order of size.

Start with the expression with the least value.

x^0 x^2 x x^{-2} $x^{1/2}$

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