

Powers

The number 5^2 is read "five squared" or "five to the second power".
The 5 is called a base number. The 2 is called an exponent.

Ex. 5^3 is "five cubed" or "five to the third"

5^4 is "five to the fourth"

5^5 is "five to the fifth"

5^6 is "five to the sixth"

The exponent tells you to multiply the base number times itself the number the exponent indicates.

5^2 means 5 times itself or $5 \cdot 5 = 25$

Note: Please be careful not to confuse this with $5 \cdot 2$

Ex. $5^3 = 5 \cdot 5 \cdot 5 = 125$

$2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$

$.3^4 = .3 \cdot .3 \cdot .3 \cdot .3 = .027$

$$\left(\frac{2}{3}\right)^2 = \frac{2}{3} \cdot \frac{2}{3} = \frac{4}{9}$$

$$\left(\frac{1}{2}\right)^4 = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{16}$$

$$r^2 = r \times r$$

Square Roots

The mathematical symbol for square root is $\sqrt{\quad}$

To find the square root of 25 look for a number that when multiplied by itself will result in 25. Therefore the square root of 25 is 5 because 5×5 is 25. $\sqrt{25} = 5$

Ex. $\sqrt{16} = 4$ $\sqrt{9} = 3$ $\sqrt{4} = 2$ $\sqrt{100} = 10$ $\sqrt{49} = 7$

All of these numbers are called "perfect squares" because there is one whole number (integer) that is the result of finding the square root.

What if you wanted to find the square root of 13?

We suggest you use your calculator. Depending on the make and model of your calculator, you may have to press the $\sqrt{\quad}$ symbol first then the number or the number first then the $\sqrt{\quad}$ symbol.

Ex. $\sqrt{13} = 3.60551275$ $\sqrt{37} = 6.08276253$
 $\sqrt{8} = 2.828427125$ $\sqrt{325} = 18.02775638$

Note: Be aware of rounding instructions when you solve a square root.

There is a method for finding non-perfect square roots that you can find in the MLC (KC-6). You decide if it's worth your time.

Powers and Roots Practice

1. 23^2

2. $\frac{1^4}{3}$

3. $5^2 + 4^3$

4. $3^4 + 2^2$

5. $.1^3$

6. $\frac{2^2}{4^2}$

7. $.05^3$

8. $\frac{(.15)^2}{(.5)^2}$

9. 1^{23}

10. $\frac{3^3 - 2^1}{2^2} \times \frac{2^3}{5^2}$

11. $\sqrt{16}$

12. $\sqrt{25}$

13. $\sqrt{49}$

14. $\sqrt{649}$

15. $\sqrt{979}$

16. $\sqrt{581.54}$

17. $\sqrt{631}$

18. $\sqrt{.064}$

19. The square root of 25 is _____.

20. Four squared minus 2 cubed is _____.

21. 6^8

22. 5^3

23. $.12^3$

24. $5^2 + 2^2$

25. $.13^2$

26. $4^5 \times 2^1$

27. $\frac{(.12)^3}{1^4}$

28. $\frac{3^4}{8}$

29. $(10^2)^4$

30. $\frac{4^2 - 3^2}{3^3} \times \frac{4^3}{56^1}$

31. $\frac{4^2}{6}$

32. $.46^2$

33. $\sqrt{32}$

34. $\sqrt{12}$

35. $\sqrt{198}$

36. $\sqrt{78}$

37. $\sqrt{144}$

38. $\sqrt{652}$

39. One fourth cubed is _____.

40. Half of the square root of 36 is _____.

41. 4^5

42. 18^2

43. $.9^2$

44. $3^3 + 2^5$

45. $.15^2$

46. $\frac{2^2}{3}$

47. $7^2 \times 3^4$

48. $(12^2)^1$

49. $6^2 - 2^3$

50. $\frac{3^2 - 4^1}{5^2} \times \frac{5^2}{2^3}$

51. $\frac{(.14)^2}{(.4)^3}$

52. $\frac{8^2}{4}$

53. $\sqrt{69}$

54. $\sqrt{56}$

55. $\sqrt{190}$

56. $\sqrt{12}$

57. $\sqrt{784}$

58. $\sqrt{982}$

59. Eight to the fourth power is _____.

60. Three to the fifth power multiplied by six is _____.

61. $(.23)^2$

62. 67^2

63. 12^2

64. $4^2 \times 7^2$

65. $.019^3$

66. $\frac{1^4}{7}$

67. $.8^3$

68. $2^8 + 5^4$

69. $\frac{3^5}{6}$

70. $\frac{6^3 - 4^3}{2} \times \frac{9^2}{3^3}$

71. $(11^2)^4$

72. $.000006^2$

73. $\sqrt{985}$

74. $\sqrt{78}$

75. $\sqrt{.00008}$

76. $\sqrt{9.89}$

77. $\sqrt{27.89}$

78. $\sqrt{9104.6}$

79. Three cubed to the fourth power is _____.

80. Five squared plus three cubed is _____.

Answer Key

1) 529	31) 2.666667 OR	61) .0529
2) OR .33	32) .2116 OR	62) 4,489
3) 89	33) 5.656854	63) 144
4) 85	34) 3.464102	64) 784
5) .001	35) 14.071247	65) .000007
6) OR .25	36) 8.8831761	66) .142857 OR
7) .000125 OR	37) 12	67) .512 OR
8) .09 OR	38) 25.534291	68) 881
9) 1	39) OR .015625	69) 40.5 OR
10) 2	40) 3	70) 228
11) 4	41) 1,024	71) 214,358,881
12) 5	42) 324	72) .000000000036
13) 7	43) .81	73) 31.38471
14) 25.475478	44) 59	74) 8.831761
15) 31.288976	45) .0225	75) .008944
16) 24.11514	46) 1.3333333	76) 3.144837
17) 25.119713	47) 3,969	77) 5.281098
18) .0252982	48) 144	78) 95.418028
19) 5	49) 28	79) 531,441
20) 8	50) OR .5	80) 52
21) 1,679,616	51) .30625 OR	
22) 125	52) 16	
23) .001728	53) 8.306624	
24) 29	54) 7.483315	
25) .0169	55) 13.784099	
26) 2,048	56) 3.464102	
27) .001728	57) 28	
28) 10.125 OR	58) 31.336879	
29) 100,000,000	59) 4,096	
30) .296296 OR	60) 1,458	