For Students

MathSmart Guide

Contents

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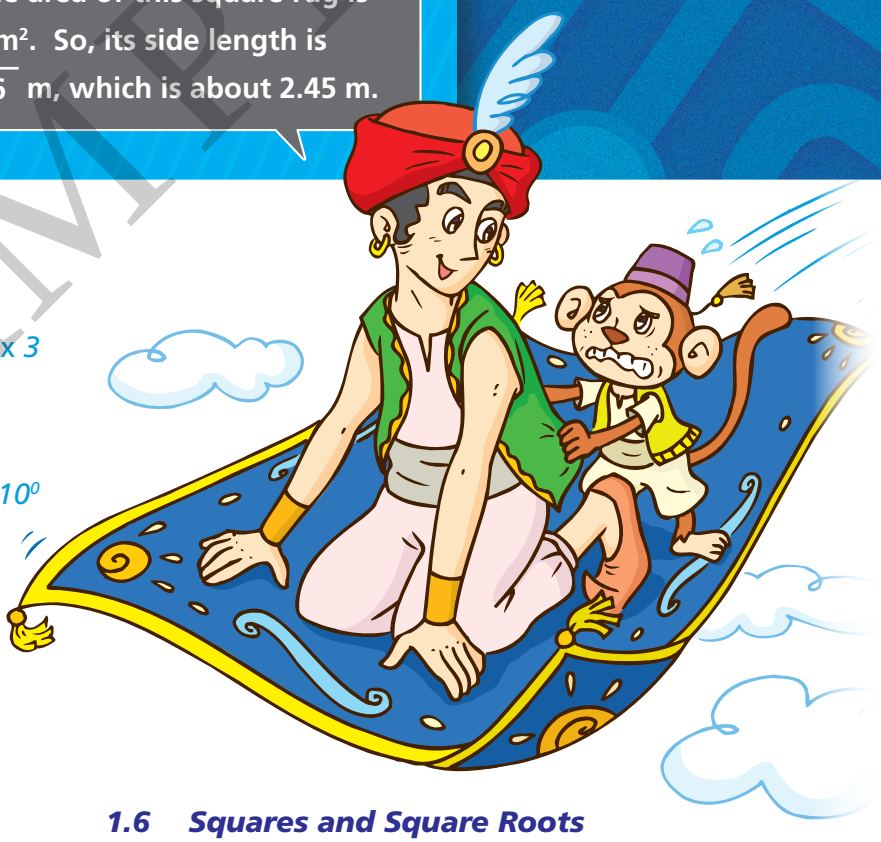
Chapter 1

Numbers

The area of this square rug is 6 m^2. So, its side length is $\sqrt{6}$ m, which is about 2.45 m.



Topics to be covered in this chapter:

1.1 Exponential Notation

e.g. 3 to the power of 4 = 3^4
= 3 x 3 x 3 x 3
= 81

1.2 Whole Numbers

e.g. 40 807 = 4 x 10^4 + 8 x 10^2 + 7 x 10^0

1.3 Integers

e.g. (-9) x (-2) = +18

1.4 Order of Operations

e.g. $(23 - 20)^2$ x 8 ÷ (2 + 4)
= 3^2 x 8 ÷ 6
= 9 x 8 ÷ 6
= 12

1.5 Common Factors and Common Multiples

e.g. The GCF and LCM of 15 and 20 are 5 and 60 respectively.

1.6 Squares and Square Roots

e.g. $\sqrt{6}$ is about 2.45.

1.7 Rational Numbers

e.g. 102 is a rational number but $\sqrt{10}$ is not.

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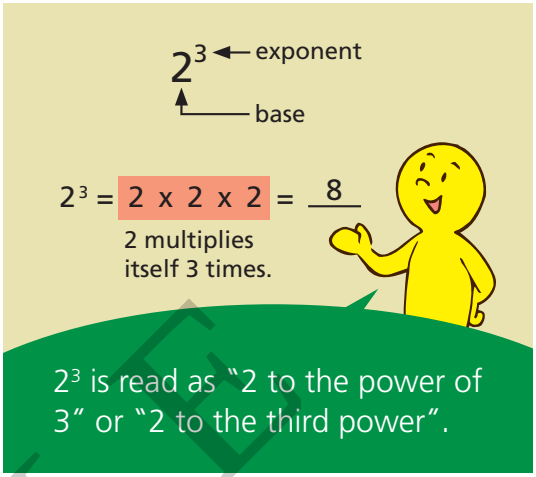
1.1 Exponential Notation

Write each answer in exponential notation or in words.

1. 5 x 5 x 5 x 5 = _____
2. 3 x 3 x 3 x 3 x 3 x 3 x 3 = _____
3. 10 x 10 x 10 x 10 x 10 = _____
4. 7 x 7 x 7 x 7 x 7 x 7 = _____
5. 12 x 12 x 12 = _____
6. 9 to the fifth power = _____
7. 4 to the power of 8 = _____
8. 5 to the sixth power = _____
9. 10 to the power of 3 = _____
10. 6 to the seventh power = _____



11. A 10^2 B 5^3 C 6^8

A _____

B _____

C _____

Write each multiplication as a product of powers.

12. 5 x 5 x 7 x 7 x 7 = $5^2 \times 7^3$
13. 2 x 9 x 9 x 2 x 2 x 9 = $2^3 \times 9^3$
14. 3 x 3 x 4 x 3 x 3 = _____
15. 10 x 10 x 6 x 10 x 6 = _____
16. 5 x 3 x 5 x 5 x 3 x 3 x 2 x 5 x 2 = _____
17. 10 x 10 x 10 x 10 x 10 x 10 x 3 x 3 x 3 = _____
18. 9 x 10 x 10 x 9 x 9 x 9 x 10 x 9 x 10 = _____
19. 8 x 7 x 8 x 6 x 7 x 8 x 6 x 6 x 7 = _____

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Write the powers as integers and the integers as powers.

20. 2^5 = _____ 3^3 = _____ 6^1 = _____

19^0 = _____ 12^2 = _____ 5^4 = _____

7^3 = _____ 15^3 = _____ 8^0 = _____

Any number raised to the power of zero equals one.

e.g. 5^0 = 1 ; 21^0 = 1

21. 1000

= 10 x _____

= _____

= 10

22. 1024

= 4 x _____

= 4 x 4 x _____

= _____

= 4

Write 81 as a power of 3.

81 = 3 x 27 ← Rewrite 27 as 3 x 9.

= 3 x 3 x 9 ← Rewrite 9 as 3 x 3.

= 3 x 3 x 3 x 3

= 3^4

23. 128 = 2

24. 729 = 3

25. 7776 = 6

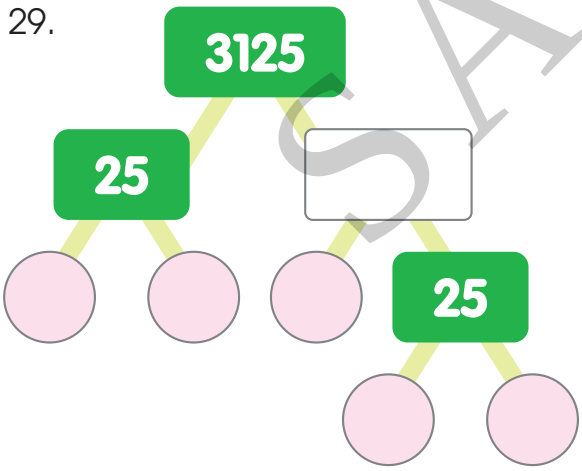
26. 1296 = 6

27. 4096 = 4

28. 59 049 = 9

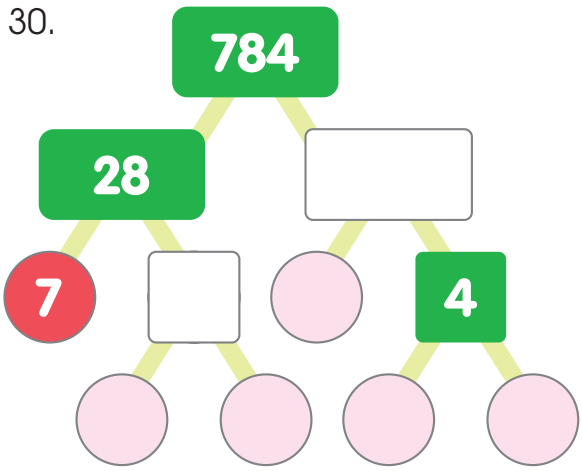
Complete each factor tree. Then write the prime factors in exponential notation.

29.



3125 = 5

30.



784 = 2 x 7

31. 72 = 2 x 3

32. 200 = 2 x 5

33. 8575 = _____

34. 2250 = _____

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Solve the problems. Show your work.

35. Are "4 to the power of 5" and "5 to the power of 4" the same? Explain your answer.

36. $5^3 = 5 \times 3$

$= 15$ ✗

Describe the mistake Kevin made. Then find the correct answer.

37. A bacterium splits into two bacteria every 15 minutes. How many bacteria will there be in 2 hours?

38. The side length of a cube is 1 m. Find the volume of the cube in m^3, cm^3, and mm^3 using an exponent.

Application

39

What are the missing exponents? What is the relationship between the number of zeros in multiples of 10 and the exponents?

1	$= 10^0$
10	$= 10^1$
100	$= 10^2$
1000	$= 10^3$
10 000	$= 10$
100 000	$= 10$
1 000 000	$= 10$
10 000 000	$= 10$

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