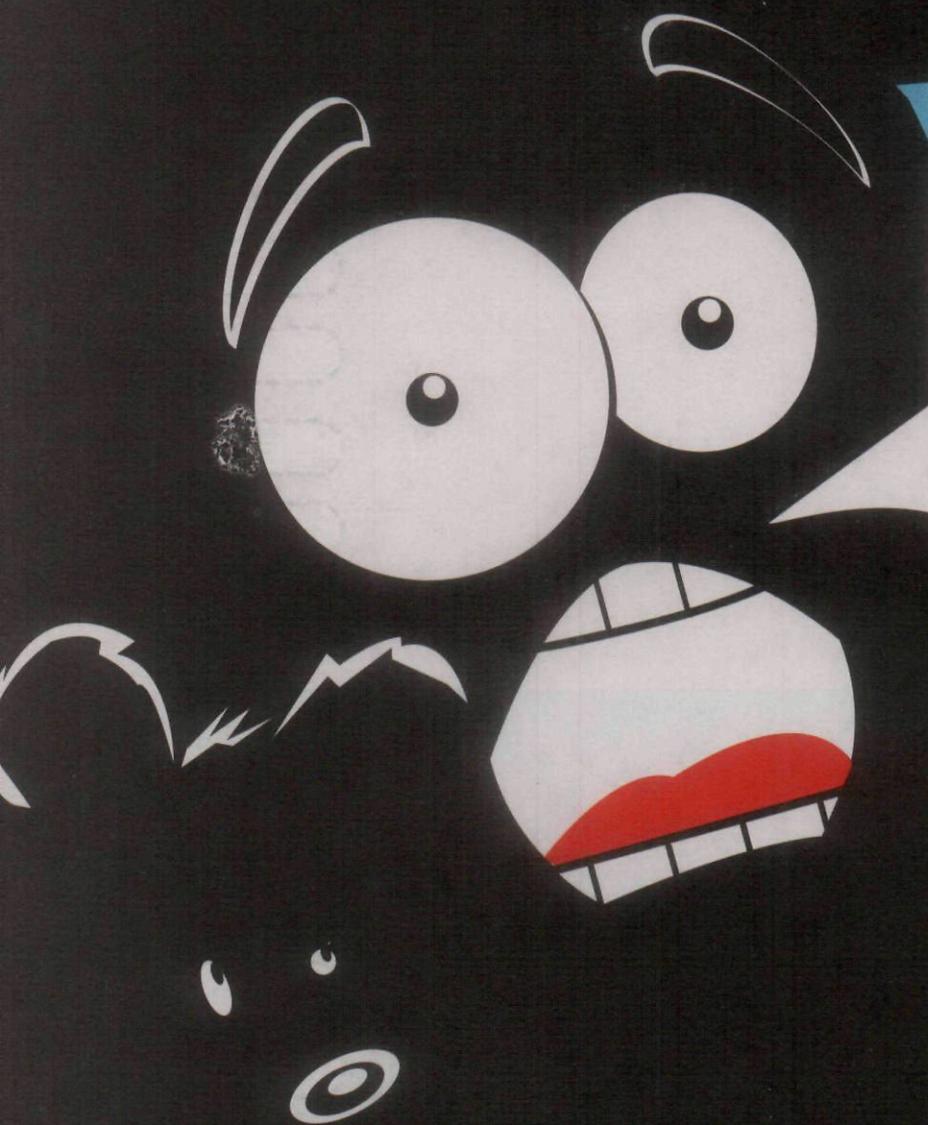


POWER OUT AT 10!



Who's there? Oh, it's just you. Sorry I didn't recognize you. I've been a little freaked out since 10 p.m., when this blackout started. (I'm also a little worried that my eyes are glowing in the dark like a cartoon character's.) Speaking of the power out at 10, try this *powers of 10* practice test while I wait for the lights to come back on. If you need me, I'll be under my bed clinging to my teddy bear, Mr. Fuzzy Pants.

STUDY TIPS

Powers of 10

✓ Powers of 10 can be written in standard form or by using *exponents*. The exponent (little number) tells you how many zeros to write after the 1.

Examples: $10^1 = 10$; $10^2 = 100$;
 $10^3 = 1,000$; etc.

✓ When you multiply by a power of 10, the decimal point is moved to the right a number of places equal to the exponent.

Example: $3.14159 \times 100 =$
 $3.14159 \times 10^2 = 314.159$

test by Laurie Boswell

For problems 1 to 6, fill in the circle of the correct answer.

1 A guy on my battery-operated radio says that the lights are out in at least ten thousand homes. I told him not to stand on my radio and to get out of my house. How would you write ten thousand using exponents?

- A** 10^2 **C** 10^4
B 10^3 **D** 10^6

2 I invented this great game called "Eat All the Food in the Refrigerator Before It Goes Bad." (I think I'm winning, but it's going to be hard to eat that whole jar of mayonnaise.) To find out how many minutes I played this game, multiply: 6.29×10

- A** 62.9 min. **C** 629 min.
B 0.629 min. **D** 16.29 min.

3 After eating all that food, I needed a nap. I dreamed that the blackout lasted 100 days! (I also dreamed that a giant jar of mayonnaise was chasing me, holding a huge spatula and wearing a pink frilly apron.) While I try to figure out what this dream means, you find how many hours are in 100 days.

- A** 24.00 hrs **C** 10,024 hrs
B 240 hrs **D** 2,400 hrs

4 I invented another game called "Count the Cat Hairs in Scruffy's Brush." (There is not much to do during a blackout.) To find out how many I counted, solve: 16×10^3

- A** 16,103 hairs **C** 1,600 hairs
B 16,000 hairs **D** 16.000 hairs

5 Now I'm seeing how many feet of duct tape it takes to wrap every piece of furniture in the house. To find out how many feet it took, solve this problem: 0.25×10^4

- A** 25 ft **C** 2,500 ft
B 2.5 ft **D** 250 ft

6 I reach for what I think is a flashlight, but it turns out to be a giant tube of toothpaste. (When I tried to turn it on, I got covered with toothpaste. I do smell minty fresh now, though.) There were 5,260 milliliters of toothpaste in the container. Between which two powers of 10 is 5,260?

- A** 10^4 and 10^5 **C** 10^3 and 10^4
B 10^2 and 10^3 **D** 10^5 and 10^6

For questions 7 to 10, write in the correct answer.

7 While trying to find my way to the basement, I stumbled upon a safe filled with money! To find out how much cash I found, in dollars, find the product of $320.8 \times 1,000$:

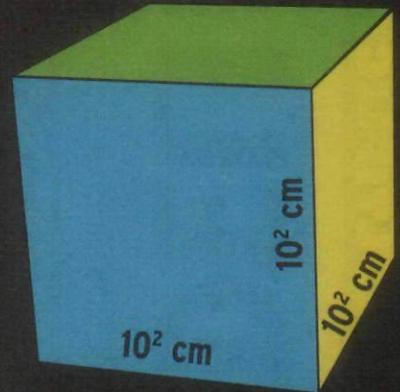
8 The "safe" turned out to be a Monopoly box, and it was play money. Now I'm making a list of things that scare me about the dark—monsters in the closet, fear of bumping into walls, and...OUCH! (Sorry, I walked into a wall.) There are 4,390 items on my list. What number could you multiply by what power of 10 to get that product? Fill in the blanks to give two possible answers.

a $\times 10^{\text{$

b $\times 10^{\text{$

9 I'm inside a cube-shaped cardboard box that I've covered in peanut butter to protect me if this blackout was caused by an alien invasion. (I saw this in a movie once.) To find the *volume* (space inside) of

the box in cubic centimeters, multiply $10^2 \times 10^2 \times 10^2$:



(Do you see a relationship between the answer and the exponents in the problem?)

BREAK THE MISTAKE!

10 After nearly two days, the lights came back on! Apparently the blackout was caused by a squirrel on a power line. (The squirrel is fine, but his hair is going to be standing up for awhile.) My friend Elle Ektryk sent me an e-mail saying the blackout had lasted 28×10^2 , or 28.00 minutes. What was Elle's error, and how would you correct it?

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