SAT Math Strategy #1: Work With The Answers

Work With The Answers

For multiple choice questions, the answer is printed right there in front of you! You can use the answers to make a tough problem easy, or even to solve a problem that you are stumped on.

When should I apply this strategy? Look for questions asking for the numerical value of a variable. Often, these questions are algebra problems or geometry problems involving algebra.

How do I apply this strategy? Pick an answer to start with; answer C is a good choice. Use it by substituting the answer value into whatever the question is asking for. Next, check to see if the equation or problem works out. If it does, you are done: the answer is C. If not, use the fact that numeric answers are always given in order on the SAT, so go on to B and A or to D and E depending on whether your answer was too large or too small. You shouldn't need to check more than three answers.

Get some practice with the problems below, all of which can be solved using this strategy. If you can solve the problem doing "real" math (I call this the "math teacher solution"), then by all means do so. The test makers expect you to solve the problem that way, and that may be the fastest way to get the answer. But remember that you get a point for the correct answer no matter how you got it.

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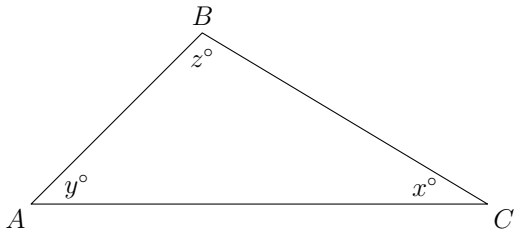
1. If $3^{n-3} + 3^2 = 18$, what is the value of n?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

2. Three consecutive integers are such that four times the least integer is three times the greatest. What is the greatest of these three integers?

(A) 6
(B) 8
(C) 10
(D) 12
(E) 14



Note: Figure not drawn to scale.

3. In triangle ABC above, the value of y is twice the value of x, and the value of z is three times the value of y. What is the value of x?

(A) 20
(B) 24
(C) 30
(D) 36
(E) 40

4. If $2^x + 2^{x+2} = 40$, then the value of x is which of the following?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

5. When each side of a particular square is lengthened by 2 inches, the area of the square increases by 32 square inches. What is the length in inches of a side of the original square?

(A) 4
(B) 5
(C) 6
(D) 7
(E) 8

Answers To SAT Math Strategy #1: Work With The Answers

1. E (Estimated Difficulty Level: 2)

Strategy Solution: Substitute the answer values in for n until the equation works. Start with answer C: $n = 3$. But $3^0+3^2 = 1+9 = 10$ so answer C is incorrect. Also, we got a number that is too small, so try D or E next. When you use $n = 5$, you get $3^2 + 3^2 = 18$ so answer E is correct.

Math Teacher Solution: Isolate the term with n: $3^{n-3} = 18 - 3^2 = 9$, so that $3^{n-3} = 3^2$. Since the bases are the same (both 3), the exponents must be equal: $n-3 = 2$ which means that $n = 5$. (Math teachers love to use words like "bases", "exponents", and "isolate".)

2. B (Estimated Difficulty Level: 3)

Strategy Solution: Use the answers, starting with C: suppose that the biggest integer is 10. Then, the three integers are 8, 9, and 10. But, $4 \times 8 = 32$ and $3 \times 10 = 30$, so answer C is incorrect. It isn't clear whether we need a bigger answer or a smaller answer, but we are close, so you should only need to try B or D. If you try answer B, the three numbers are 6, 7, and 8, and $4 \times 6 = 3 \times 8$, so B is correct.

Math Teacher Solution: Let x be the greatest of the three integers. Then, the three integers from least to greatest is $x - 2$, $x - 1$, and x. Since four times the least is three times the greatest, $4(x - 2) = 3(x)$, or $4x - 8 = 3x$. Solving for x gives $x = 8$. (Math teachers like to use the word "greatest" rather than "biggest".)

3. A (Estimated Difficulty Level: 3)

Strategy Solution: Let's try answer C and make $x = 30$. Then, $y = 60$ and $z = 180$, which means that $x + y + z = 270$. Incorrect! We need a smaller value for x, so try A or B. If you use answer A, you'll get $x = 20$, $y = 40$, and $z = 120$ so that $x + y + z = 180$, making A the correct answer.

Math Teacher Solution: Since the three angles are in a triangle, $x + y = z = 180$. Also, $y = 2x$ and $z = 3y = 3(2x) = 6x$. Substituting into the first equation, $x+2x+6x = 180$ so that $9x = 180$, resulting in $x = 20$.

4. C (Estimated Difficulty Level: 4)

Strategy Solution: Substitute the answer values in for x until the equation works. Start with answer C: $x = 3$. Then, $2^3 + 2^5 = 8 + 32 = 40$ so answer C is correct! We got a little bit lucky this time by starting with the answer that happened to be the correct one. But will you get anything less than a full point for this question just because you got lucky? Of course not.

Math Teacher Solution: There is a common factor of 2^x in the left-hand side of the equation: $2^x + 2^{x+2} = 2^x(1 + 2^2) = 2^x(5) = 40$. Dividing both sides by 5 gives $2^x = 8$, which means that $x = 3$. (Math teachers love to factor things.)

5. D (Estimated Difficulty Level: 4)

Strategy Solution: Start with answer C: suppose the square has a side of 6. The square's area is then $6^2 = 36$. The larger square has a side of 8 and an area of $8^2 = 64$. The *increase* in area is $64 - 36 = 28$ so answer C is incorrect. We were a little too low, so try answer D next. Now, $7^2 = 49$ and $9^2 = 81$ so the increase is $81 - 49 = 32$. Answer D is correct!

Math Teacher Solution: Let the length of one side of the original square be s. Then, the original square's area is s^2. When the length of the side increases to $s+2$, the area increases to $(s + 2)^2$. The *increase* in area is $(s + 2)^2 - s^2 = s^2 + 4s + 4 - s^2 = 4s + 4 = 32$. Solving for s gives $4s = 28$ so that $s = 7$. (You really need to be a math teacher to like this solution best.)