13. Simple Interest (A'Prt) This one appears less often than the complex interest on the SAT, but it still appears, so it's worth knowing. (P) represents the principal amount, (r) is the interest rate expressed as decimal, and (t) for a time, usually in years. 14. Complex interest (A - P(1) and (frac'r'n) The good news is that in this equation means the same as in simple interests. 15. Average/average in math, the words average and average are the same: the number you get when you take the amount of the set and divide it by the number of values in the set. You can also think of it as the amount divided into the account. You need to know how to calculate the average and interpret it. Be sure to understand the difference between average and average. 16. Random sampling is technically not a formula, but many of the statistical problems based on the SAT focus more on interpreting concepts in context rather than performing mathematical operations. A random sample is when you select participants to study at random in your population. This ensures that your research is representative of the population. 17. Accidental appointment is a random appointment when study participants are prescribed treatment or trial at random. This reduces bias in your study, and means that you can attribute a causal link to the treatment. On the SAT, you are often asked about what will reduce bias, or how much you can summarize the results for the rest of the population. In these cases, random sampling and random assignments need to be determined. 18. You won't need to calculate a standard deviation for the SAT, but you'll be tested on it conceptually, just as you did with random sampling and random appointments. Standard deviation is a measure of distribution in the dataset. A higher standard deviation means a larger spread, and lower standard deviations mean a smaller spread. You need to know how changes in the dataset can affect the standard deviation by making it bigger or smaller. Geometry and trigonometry 19. The equilateral triangle area (A'frac'sqrt{3}s'2'{4}) is the usual triangle formula area on the SAT reference sheet, but it requires you to know the height of the triangle. Sometimes you are not given height and you will need to calculate it, but you can quickly find the area of the equilateral triangle by connecting the length of one of its sides to the formula above. There is no need to calculate the height! 20. The Circle Equation (x-h) (2'(y-k) In this equation, (h,k)) is the coordinate for the center of the circle, and radius of the circle. What role does your SAT score play in getting accepted into the school of your dreams? Find out by calculating your chances now. 21. Sine Ratio Some students get nervous when they hear that the trigger is on the SAT, but most often appears as trigger ratios. Remember that for this particular angle in the right triangle, the sinus value is the length of the opposite side divided by the length of the hypotenuse, or the opposite/hypotenuse. 22. Cosin Ratio is the same as with sinus, remember that the cosy ratio: the length of the neighboring side is divided by the length of the hypotenuse, or adjacent/hypotenuse. 23. The tangent ratio is the latter, but not least, the tangent ratio is the length of the opposite side divided along the length of the adjacent side, or the opposite/adjacent. Some students find the mnemonic SOH CAH TOA useful for memorizing trigger ratios. 24. Degrees for Radians Although the most common form of trigger are the main ratios, you may encounter things such as circle units or more advanced math. If you need to convert degrees into radians, multiply the degrees by {180} (frac'pi). If you need to convert the radiants to a degree, multiply the radian by q (frac{180}'pi'). 25. The Pythagoras theorem applies to the right triangles and allows you to settle for one of the lateral lengths taking into account any other lateral length. A) and C (b) are triangle legs, and (c) is a hypotenuse. 26. The regular intra-corner landfill (Frak (n-2)180'n) SAT is likely to involve one issue with a regular landfill that is not a triangle or square. Regular landfills have unique and consistent properties depending on their number of parties, and knowing these properties can help you solve these problems. This equation tells you that the degree of measurement at each angle is based on the number of sides (n). 27. The 3-4-5 Triangle SAT provides you with four special right triangles you may already be familiar with on your reference sheet of-30-60-90 and 45-45-90 triangles. However, 3-4-5 is a special right triangle with sides that are simple integers. This triangle is often included in the SAT problem, especially without the calculator part, so be on the lookout for it! This can save you from using the Pythagoras theorem. 28. 5-12-13 Triangle Another special right triangle with a whole number of sides, the triangle 5-12-13 is less known and appears less frequently than 3-4-5. However, it helps to be able to quickly resolve the remaining parties without the Pythagoras theorem, so check these numbers or their multiples in triangle problems. 29. The length of the arc in the circle (length:of:arc : fraccentral:corner {360}'pi d) Although geometry issues do not constitute a huge part of the SAT, you can still find a question about either arcs or sectors in a circle. The arc is the length between the two points on the Usually usually by extending two radii from the center of the circle with an angle formed between them. You can use the measurement degree of the arc as a lob (360) and multiply it by the equation for the circumference to find the length of the arc. 30. Sector area in the circle (area:sector:sector:sector:{360}'pi r'2) Like an arc, the sector is an area between two radii extending from the circle, sort of like a piece of cake. Again, multiply the degree measure as a share (360) and multiply it by an equation for the circle area to find the area of the sector. Wrapping it up before you go, we're going to offer you a bonus tip: you can remember the perfect squares and perfect cubes. This can help you with square equations that are often connected by squares, and cubes are often used in solving problems with exhibitors. Remembering these will reduce your need to do math from scratch from paper or calculator. The best way to remember formulas is to practice using them. Unlike your high school math test, where you know which topics will be covered, the SAT will simply present you with a question - it's up to you to determine which formulas apply. When you practice using formulas with different problems, you can quickly determine which formula to use. Preparing for the SAT? Download our free guide with our top 8 tips for mastering the SAT. Wondering how your sat score affects your chances of taking to the school of your dreams? Our free Chancing Engine will not only help you predict your odds, but will also let you know how you stack up against other applicants and what aspects of your profile to improve. Sign up for a free CollegeVine account today to access our Chancing Engine and get a jumpstart on your college strategy! Check out some of our other posts on math prep: SAT math test unlike any math test you've taken before. It is designed to take the concepts you are used to and make you apply them in new (and often bizarre) ways. It's tricky, but with attention to detail and knowledge of the basic formulas and concepts covered by the test, you can improve your score. So, what formulas should you remember for the SAT math section before test day? In this complete guide, I'll cover all the critical formulas you need to know before you sit down for the test. I'll also explain them in case you need to run around your memory of how the formula works. If you understand every formula on this list, you will save yourself valuable time on the test and will probably get a few extra questions correctly. Formula, data on the SAT, Explained This is exactly what you will see at the beginning of both sections of mathematics (calculator and no calculator section). It can be easy to look right past it, so familiarize yourself with the formulas now so as not to waste time on Testing. You are given 12 formulas per yourself and the three laws of geometry. This can be useful and save time and effort to memorize the formula data, but it is ultimately not necessary, as they are given on each section of sat math. You are given only geometry formulas, so prioritize remembering algebra and trigonometry formulas before testing day (we'll cover them in the next section). You should focus most of your research efforts on algebra anyway, because geometry has been de-emphasized on the new SAT and now makes up only 10% (or less) of questions on each test. However, you need to know what these geometry formulas mean. The explanations for these formulas are: Circle Square $$A r2$$$π constant, which can, for SAT purposes, be written as 3.14 (or 3.14159) r circle radius (any line drawn from the center point straight to the edge of the circle) Circle circle $C '2'r$ (or $C'd$) d circle diameter. This is a line that separates the circle through the middle and touches two ends of the circle on different sides. That's twice the radius. The area of the rectangle $$A and lw$$L is the length of the rectangle w is the width of the rectangle Triangle area $$A and 1/2bh$$ b is the length of the base of the triangle (edge of one side) h is the height of the triangle in the right triangle, the height is the same as the side of the 90-degree angle. For the wrong triangle, the height will fall down through the inner part of the triangle, as shown above (unless otherwise stated). The Pythagoras theorem $$a 2 and b'2 and c'2$$ In the right triangle, the two smaller sides (a and b) are squared. Their sum is equal to a square of hypotenuse (c, the longest side of the triangle). Properties of the special right triangle: The Isoseles An isosceles Triangle has two sides that are equal in length and two equal angles opposite these sides. The right triangle isosceles always has a 90-degree angle and two 45-degree angles. Side lengths are determined by the formula: x, $$x, $x√2$, with hypotenuse (side opposite 90 degrees), having the length of one of the smaller sides √2$. For example, the right triangle isosceles can have side lengths of $12, $12,12 and $12√2$. The properties of the special right triangle: 30, 60, 90 degrees triangle 30, 60, 90 triangle describes the degree of the triangle measure three angles. Side lengths are determined by the formula: x, $x√3$and $2x$ Side opposite 30 degrees is the smallest, with a measurement of $$x.$. The side is opposite 60 degrees of medium length, with a measurement of $x√3$. The side opposite the 90 degree hypotenuse (the longest side), with a length of $2x$. For example, a triangle 30-60-90 can have side lengths of 5, $5√3 and $10.3. The volume of the rectangular solid $$V lwh$$L the length of one of the parties. The volume of the cone $$V (1/3) 2rh$$$r$ is the radius of the circular side of the cone. h is the height of the pointy part of the cone (as measured from the center of the circular part of the cone). $w $ is the width of one of the edges of the rectangular part of the pyramid). Law: The number of degrees in the circle 360 Act: the number of radians in a circle is $2 law: the number of degrees in the triangle 180 Gear up that brain, because here come the formulas that you have to remember. Formula not taking the test for most of the formulas on this list, you just need to buckle down and memorize them (sorry). Some of them, however, may be useful to know, but ultimately do not need to be memorized, as their results can be calculated by other means. (It's still helpful to know these though, so take them seriously). We've broken the list on Need to Know and Be Good to Know, depending on whether you're a formula-loving test taker or a smaller formula-better kind of test take. Slopes and graphs should know the slope formula Given the two points $A (x_1, y_1), $B (x_2, y_2)$, find the slope line that connects them: $$(y_2 - y_1)/(x_2 - x_1)$$lant is $'rise (vertical change) / launch (horizontal change)$. How to write a line equation Line Equation written as: $$y and mx and b$$ If you get an equation that is not in this form (like $mx b$) and then rewrite it in this format! It is very common for the SAT to give you an equation in a different form and then ask you whether the slope and interception are positive or negative. If you don't rewrite the equation into $y mx and b$, and misinterpret what tilt or interception is, you'll get the question wrong. m is the tilt of the line. b is y-intercept (the point where the line ends up in the axis). If the line goes through the origin of $$0,0)$, the line is written as $y mx$. It's good to know The Midpoint Formula Given the two $A (x_1, y_1)$, $B (x_2, y_2)$, find the middle of the y_2 y_1 line, that connects them: $$((x_1 and x_2)/2, $A (x_1, y_1), $B (x_2, y_2),find the distance between them: $√ (x_2 - x_1 y_1 y_2) Distance will be hypothetical, which you can find through the Teore Pythgora Circles. Radius and degree of measurement of the arc from the center, find the length of the arc Use the formula for the circumference multiplied at the angle of the arc, Divided by the total measure of the circle angle (360) $$L arc (2'r)(degree measure centerarcs/360)$E.g., 60 degree arc is $1/6 of the total circumference, because $60/360 and 1/6 $8 area arc sector given the radius and degree of measurement of the arc from the center, Find the arc sector area Use a formula for an area multiplied by the angle of the arc, separated by a common angular measure of the circle of $$A'arc ('r'2) (the degree of measurement of the center arc/360)$ The alternative to memorizing the formula is to just stop and think about the circumference of the arc and the arc area logically. You know the area and circle circumference formulas (because they are in the field of this equation on the test). You know how many degrees are in the circle (because it's in your equation field on the text). Now put the two together: If the arc covers a 90 degree circle, it should be $1/4 of the total area/circle circumference, because $360/90 and $4 if the arc is at a 45 degree angle, then it's $1/8th circle because it's $360/45 and $8.8 billion. The concept is exactly the same as the formula, but it can help you think about it this way and not as a formula to remember. Algebra Need to know the quadratic equation Given the polynomial in the form of $ax'2'bx'c$, solved for x. $. $$x'b±'b'2-4ac'/$$$$ Just plug in the rooms and decide for x! Some of the polynomials you'll encounter on the SAT are easily accounted for (e.g. $x-2'3x-2$, $4x-2-1$, $x'2-5x-6$, etc.), but some of them will be harder to account for and almost impossible to obtain with simple trial and error mental math. In these cases, the square equation is your friend. Make sure you don't forget to make two different equations for each polynomial: one that is $x'b'√'2-4ac'/'2a'$and one that is $x'-b-'b'2-4ac'/'2a'$. Note: If you know how to complete a square, then you don't need to memorize a square equation. However, if you are not quite comfortable with completing the area, then it is relatively easy to remember the square formula and have it ready. I recommend memorizing it to the tune of either Pop Goes The Weasel or Row, Row, Row Your Boat. Averages need to know that the average is the same as the average Find average/average of a set of numbers/terms $$'Average's amount amount of terms / umber various terms$$$Speed total distance/total time$Probability Need to know the probability that it is an idea of odds. $-text Probability of exodus - text number of desired results / Text Total number of possible outcomes $$ Well know the probability of 1 guaranteed to happen. Probability 0 will never happen. Interest Know Find x percent of this number n. $$n (x/100)$$ Find out what percentage number n has another number m. $$(n100)/m$$ Find out what number n is x percent. $$(n100)/x$$Trigonometry Trigonometry is a new addition to the new SAT Math section 2016. Although this amounts to less than 5% of mathematical questions, you will not be able to answer trigonometry questions without knowing the following formulas. You need to know, find a sinus angle given the measures of the sides of the triangle. $sin (x)$' Measuring the opposite side to the corner / Measuring the hypotenuse In the picture above, the sinus of the marked angle will be a/h. Find a cosine angle given the measures of the sides of the triangle. $cos (x)$' Measuring the adjacent side to the corner/ Measuring the hypotenuse In the picture above, the cosine marked angle will be b/h. Find a tangent based on the measures of the triangle sides. $tan (x)$' Measuring the opposite side to the corner / Measuring the adjacent side to the corner In the picture above, the tangent of the marked angle will be a/b. A useful memory trick is the acronym SOHCAHTOA. Sine Is Equally Opposite Hypotenuse Cosine Equally Adjacent Over Hypotenuse Tangent is still opposite over the neighboring SAT Math: Aside from the formulas While these are all the formulas you need (the ones you've given, as well as the ones you need to remember), this list doesn't cover all aspects of SAT Math. You also need to understand how to factor equations, how to manipulate and solve for absolute values, and how to manipulate and use exhibitors, and more. All of these topics are covered here. Another important thing to remember is that when memorizing the formulas in this article that are not given to you for the test is important, knowing that this list of formulas does not mean that you are all set for SAT Math. You should also practice applying these formulas to answer questions so that you know when it makes sense to use them. For example, if you are asked to calculate how likely is it that white marble will be drawn from a jar that contains three white marbles and four black marbles, It's easy enough to understand that you need to adopt this probability formula: $'text Probability result' total of possible results '$$ and use it to find the answer: $' White Marble Text Probable - Text Number of White Balls/Text The total number of $$Text The probability of white marble - 3/7$ In the SAT math section, however, you'll also work in more complex probability questions like this one: Dreams recalled during one week No 1 to 4 5 or more Total Group X 15 28 57 100 Group Y 21 11 68 100 Total 36 39 125 200 Data in the table above was produced by a sleep researcher studying the number of dreams people remember when told to record them for one week. Group X consisted of 100 people who observed early sleep time, and group Y consisted of 100 people who watched later before bedtime. If a person is randomly selected from someone who has remembered at least one dream, what is the probability that the person belonged to the group Y? A) $68/100$ B) $79/100 $C) $79/164$D) $164/200 There's a lot of information to synthesize in this matter: a data table, two long sentences explaining the table, and then finally what you need to solve. If you haven't practiced this kind of problem, you won't necessarily realize that you'll need that probability formula you memorized, and it can take a few minutes to fumble around the table and rack your brain to figure out how to get answer-minutes that you now can't use for other questions in the section or check your work. If you have practiced these kinds of issues, however, you will be able to quickly and effectively deploy this learned probability formula and solve the problem: It is a question of probability, so I, Probably (ha) need to use this formula: $ $'text Probable result - text the number of desired results /text the total number of possible results Here are these bold cells: No from q 1 to 4 5 or more Total Group X 15 28 57 100 group Y 21 11 68 100 And then the total number of possible results is all people who are reminded of at least one dream. To get this, I have to subtract the number of people who don't remember at least one sleep (36) of the total number of people (200). Now I'll put it all back into the equation: $'text Likely Exodus - 11'68'/ $200-36'$'text Likely result - {79}/{164}$ Correct answer C) $79/164 $ Takeaway from this example: once you remember these mathematical SAT formulas, you should find out when and how to use them, to use the questions yourself. What's next? Now that you know the critical formulas for the SAT, it may be time to check out the full list of SAT mathematical knowledge and know-how you need before the day of testing. And for those of you with particularly high score goals, check out our article on how the 800 on SAT Math is on the perfect SAT-Scorer. Currently scoring in the middle of the range in math? Look no further than our article on how to improve your score if you are currently scoring below the 600 range. Want to improve your SAT score by 160 points? Check out our best-in-class online SAT prep classes. We guarantee your money back if you don't improve your SAT score by 160 points or more. Our classes are completely online and they are taught by SAT experts. If you liked this article, you'll love our classes. Along with expert classes, you'll get personalized homework with thousands of hands-on problems organized by individuals So you'll learn most effectively. 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