

WORKED MATH SOLUTIONS FOR THE 2005 SAT PRACTICE TEST (SECTION 8)

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Please refer to the relevant sections of the *SAT Preparation Booklet 2004-2005 For The New SAT* for the corresponding questions. The questions cannot be reproduced here as they are copyrighted materials. The practice test is also downloadable from:
http://www.collegeboard.com/student/testing/sat/prep_one/test.html

Section 8

1. Correct answer: D

If notebooks cost \$2 each, n notebooks will cost \$ $2n$.
 If backpacks cost \$32 each, b backpacks will cost \$ $32b$.
 The total cost in dollars would thus be $2n + 32b$

The answer is (D) $2n + 32b$

2. Correct answer: D

$$\text{Average} = \frac{\text{Sum of terms}}{\text{Number of terms}}$$

$$\Rightarrow 19 = \frac{6 + 19 + x}{3}$$

$$\Rightarrow 57 = 25 + x$$

$$\Rightarrow 32 = x$$

The answer is (D) 32.

3. Correct answer: A

a	Number of sandwiches Ali made
b	Number Ben made
c	Number Carla made.
$a + b + c = 20$	Ali, Ben, and Carla made a total of 20 sandwiches (Equation 1)
$b = 3a$	Ben made 3 times as many as Ali (Equation 2)
$c = 2b$	Carla made twice as many as Ben (Equation 3)
$c = 6a$	Substituting equation 2 into equation 3 (Equation 4)
$a + 3a + 6a = 20$	Substituting equations 2 and 4 into equation 1
$\Rightarrow 10a = 20 \Rightarrow a = 2$	

The answer is (A) Two.

4. Correct answer: C

You do not need to solve for n .

Notice that 3 percent of n is 100 times 0.03 percent of n .

Since 0.03 percent of n is 3, 3 percent of n is $3 \times 100 = 300$

The answer is (C) 300.

5. Correct answer: B

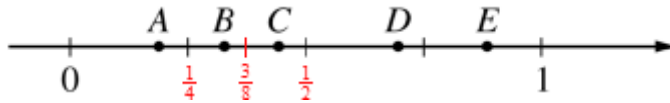
For every 2 units of run, the drop is 3 units.

Since $\text{slope} = \frac{\text{rise}}{\text{run}}$, $m = -\frac{3}{2}$ (a drop is a negative rise)

The y intercept is 3. So $y = -\frac{3}{2}x + 3$

The answer is (B) $y = -\frac{3}{2}x + 3$

6. Correct answer: B



Since there are four equal spaces between 0 and 1, each space must represent $\frac{1}{4}$.

You could thus label the line as shown.

$\frac{3}{8}$ is halfway between $\frac{1}{4}$ and $\frac{1}{2}$; draw a tick mark there and label it.

Point B is the only named point between $\frac{1}{4}$ and $\frac{3}{8}$.

The answer is (B) B .

7. Correct answer: D

$$x^{-1}h = 1$$

$$\Rightarrow \frac{h}{x} = 1$$

$$\Rightarrow h = x$$

$|x^{-1}$ is the same as $\frac{1}{x}$

The answer is (D) x .

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8. Correct answer: D

$$2x + 4x = 180^\circ \quad | \text{ Since a line is } 180^\circ$$

$$\Rightarrow 6x = 180$$

$$\Rightarrow x = 30$$

$$y = 2x \quad | \text{ Since vertical angles are equal}$$

$$\Rightarrow y = 60$$

The answer is (D) 60.

9. Correct answer: C

$$x^2 + x = 30$$

$$\Rightarrow x^2 + x - 30 = 0$$

$$\Rightarrow (x + 6)(x - 5) = 0 \quad | \text{ Factoring}$$

$$\Rightarrow x = -6, 5$$

Plugging in the values:

$$x = -6 \Rightarrow x^2 - x = 42, \text{ which is not one of the choices.}$$

$$x = 5 \Rightarrow x^2 - x = 20$$

The answer is (C) 20.

10. Correct answer: B

You might be tempted to choose E as it certainly looks like the hill Mark rode on, but look again at what the graphs represent.

Note that the y -axis represents the distance traveled, not elevation, and the x -axis represents the time from the start of the trip.

Distance can only increase with time; otherwise it would imply a negative distance traveled within that time, which is impossible. So the line cannot be sloping downwards; D and E are eliminated.

Unless Mark has teleportation powers, the distance traveled at the beginning of the trip (time 0) must also be 0. So the graph must start at point (0,0); C is out.

His uphill trip in the first 10 minutes was only 1 mile long; A is out.

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B is the only answer left, and is thus the right answer.

11. Correct answer: E

For this type of questions, assume Murphy's Law: if anything can go wrong, it will go wrong.

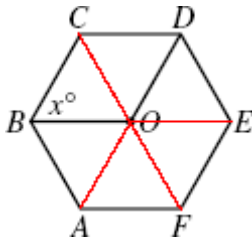
So what's the absolute worst thing that could happen? You need 3 scarves of the same color. Say that the first two scarves drawn are red. You'll be hoping for another red one; but guess what, that's not what you get, thanks to Murphy's Law.

You continue drawing boxes, but cannot reach your target of 3 scarves of the same color. You can write the colors of the scarves so drawn down, taking care not to give yourself 3 matching scarves. Since there are four colors, when you are at the 8th box, you'll find that you have 8 scarves, 2 of each color.

Now, when you draw the 9th one, you will make a set of 3 of the same color, no matter which color the next one turns out to be. So you only need to draw 9 boxes to guarantee getting 3 scarves of the same color. Even Murphy's Law can't stop you now, unless you fall down the stairs carrying so many boxes, but we can ignore that.

The answer is (E) 9.

12. Correct answer: B

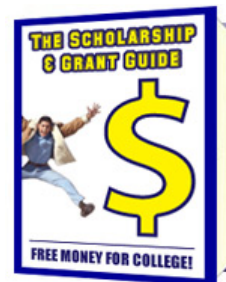


Because of the symmetry of the regular hexagon, the six angles AOB , BOC , COD , DOE , EOF , and AOF are all equal. Since the sum of these angles is 360° , $\angle BOC = 60^\circ$.

If two sides of a triangle are equal, their opposite angles are equal. Since O is the center of the hexagon,

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$$OB = OC \Rightarrow \angle BCO = x.$$

Since a triangle's internal angles add up to 180° ,

$$x + \angle BCO + \angle BOC = 180$$

$$\Rightarrow 2x + 60 = 180$$

$$\Rightarrow 2x = 120$$

$$\Rightarrow x = 60$$

The answer is (B) 60.

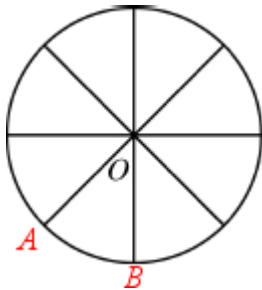
13. Correct answer: C

Substituting $p + r$ for x in the definition of f gets you

$$f(p + r) = 5(p + r) = 5p + 5r$$

The answer is (C) $5p + 5r$

14. Correct answer: C



$$A = \pi r^2 = 25\pi$$

$$\Rightarrow 25\pi = \pi r^2$$

$$\Rightarrow 25 = r^2$$

$$\Rightarrow 5 = r$$

The circumference is $2\pi r = 10\pi$.

Since the eight sectors in the circle are congruent,

$$\text{arc } AB = \frac{1}{8} \text{ of the circumference} = \frac{1}{8} \times 10\pi = \frac{5}{4}\pi.$$

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The perimeter of sector AOB consists of two radii (r) and arc AB , which equals $10 + \frac{5}{4}\pi$

The answer is (C) $10 + \frac{5}{4}\pi$

15. Correct answer: A

$$2x - 5y = 8 \quad | \text{Equation 1}$$

$$4x + ky = 17 \quad | \text{Equation 2}$$

$$-4x + 10y = -16 \quad | \text{Multiply Equation 1 by } -2$$

$$\Rightarrow (10 + k)y = 1 \quad | \text{By addition with Equation 2}$$

In order for this equation to have no solution, $10 + k$ has to equal 0 to produce the false statement $0 = 1$.

$$10 + k = 0 \Rightarrow k = -10$$

The answer is (A) -10

16. Correct answer: E

Note that the column headings in the table given are rather ambiguous. From the explanation given in the question stem, you could rename the first column 'Throw #' and the second column 'People who missed/eliminated' to make things clearer.

Statement I must be true, as out of the 25 people who played, only 7 missed the first throw, which is less than one half $\left(\frac{25}{2} = 12.5\right)$, so more than half the people must have hit the target on their first throw.

Statement II must be true:

The number of throws attempted is $1 \times 7 + 2 \times 6 + 3 \times 6 + 4 \times 4 + 5 \times 2 = 63$. The number of throws missed is $7 + 6 + 6 + 4 + 2 = 25$. So the number of throws that hit the target is $63 - 25 = 38$. More throws hit the target than missed the target.

Statement III must be true, as all 25 people missed and were thus eliminated within the 5 throws recorded in the chart.

The answer is (E) I, II and III.

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SOME USEFUL TIPS FOR THE MATH SECTION

- Familiarize yourself with the directions for the different types of questions ahead of time.
- Understand how to complete the grids for student-produced response questions. For this format, there shall be no answer that is negative, greater than 9999 or irrational – if you do get any of these, then you need to re-work your solution.
- Ask yourself: “What is this question asking?” and “What do I know?” before you solve each problem.
- Answer easy questions first. (Within each set, easy questions usually precede hard ones.)
- Mark skipped questions in your exam book so you can quickly return to them later.
- For multiple-choice, make educated guesses if you can. Try to rule out as many choices as you can so that you have a better chance of guessing the right answer. If you can eliminate even one choice, then it is worthwhile make an educated guess. Skip the question if you are not able to rule out any choice. This will avoid the penalty of losing $\frac{1}{4}$ point if you get the answer wrong.
- Work out the problems in your test booklet – this allows you to easily check your work later if you have time to review your answers. Do make sure that your answers go on the answer sheet – you will not receive credit for anything written in the test booklet.
- Don’t get carried away with working out detailed calculations. You have limited time and the objective is to get the correct answer as fast as possible, so use shortcuts where appropriate.
- Don't spend too much time on any one question. All questions are worth the same number of points.
- Avoid careless mistakes. Check that your answer makes sense.
- For more practice, go to <http://www.onlinemathlearning.com/wms-sat> for free Math practice questions.
- If you need more help preparing, take a look at SAT prep programs like [Thomson Peterson’s](#) or [WordSmart](#).
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- As a student finishing high school and preparing for college, what other areas, services or resources would be helpful to you if they can be provided via the Internet?

Good luck in your SAT test!