SAT Math Easy Practice Quiz #2

Numbers and Operations

1. A meter is a measure of length, and 10 decimeters is equal in length to one meter. How many decimeters are equal in length to 12.5 meters?

   (A)   1250
   (B)   125
   (C)   12.5
   (D)   2.5
   (E)   1.25

2. Katie went to a store to buy two kinds of tomatoes. She bought 5 purple tomatoes for $1.20 and 6 green tomatoes for $1.80. At home, Katie put 3 purple tomatoes and 4 green tomatoes on a chair. What was the total cost in dollars of the tomatoes on the chair?

   (A) $1.80
   (B) $1.86
   (C) $1.92
   (D) $2.00
   (E) $3.00

$$2, \ 3, \ 6, \ n, \ 42, \ \ldots$$

3. The first term of the sequence above is 2, and each term after the first is 3 less than 3 times the previous term. What is the value of n?

   (A)   9
   (B)   12
   (C)   15
   (D)   18
   (E)   21

4. Sixteen ounces is equal to one pound, and one ton is equal to 2,000 pounds. How many ounces equal two tons?

   (A)   4,000
   (B)   16,000
   (C)   32,000
   (D)   32,016
   (E)   64,000

5. At the Slightly Fluffy Cats and Dogs pet store, 40% of the 30 cats have brown eyes. The fraction of dogs at the store with green eyes is equal to the fraction of cats at the store with brown eyes. How many of the 40 dogs at the store have green eyes?

   (A)   8
   (B)   10
   (C)   12
   (D)   14
   (E)   16

6. The sum of which of the following combinations of numbers must be even?

   (A)   One odd and one even number
   (B)   Two even numbers and one odd number
   (C)   Three odd numbers
   (D)   Three even numbers
   (E)   Five odd numbers

7. If n is a prime number, then $6n$ must be

   (A)   odd
   (B)   prime
   (C)   a multiple of 3
   (D)   a multiple of 12
   (E)   equal to 12

8. How many integers between 9 and 99 have an even tens digit and an odd units (ones) digit?

SAT Math Easy Practice Quiz #2

Algebra and Functions

1. If $2x - 1 = 6$, what is the value of $2x + 1$?

    (A)   7
    (B)   8
    (C)   9
    (D) 10
    (E) 12

2. Which of the following represents 3 times the sum of x and 8?

    (A) $3(x + 8)$
    (B) $3x + 8$
    (C) $x + 8$
    (D) $x + 24$
    (E) $24x$

x	y
-1	-5
0	-6
2	-2
3	3
5	19

3. Which of the following equations is satisfied by the five pairs of numbers shown in the table above?

    (A) $y = -2x - 6$
    (B) $y = 2x + 6$
    (C) $y = x^2 - 6$
    (D) $y = x^2 - 4$
    (E) $y = x^3 - 12$

4. The function f is defined by $f(x) = 3x + 1$. Which of the following is equal to $f(x) + 1$?

    (A) $3x + 2$
    (B) $3x + 3$
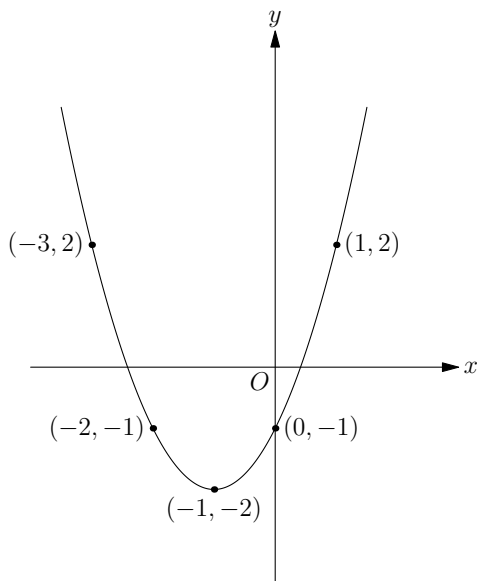   (C) $3x + 4$
    (D) $4x + 1$
    (E) $4x + 2$

5. If $2x < 9$ and $3x > 11$, which of the following is a possible value of x?

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

6. The cost of a rental car from Garbanzo Auto is a one-time payment of \$40, plus \$80 per day for each day that the car is rented. If a car is rented for d days, which of the following functions f models the total cost in dollars to rent the car?

    (A) $f(d) = 40d$
    (B) $f(d) = 40 + d$
    (C) $f(d) = 40 + 80d$
    (D) $f(d) = 120 + d$
    (E) $f(d) = 120 + 40d$

7. The graph shown in the figure above is a parabola. For points (x, y) that are on the graph, the minimum value of y is attained at what value of x?

(A) -3
(B) -2
(C) -1
(D) 0
(E) 1

8. If $\sqrt{2m + 1} = \sqrt{3m - 3}$, what is the value of m?

9. If $a + b = c$ and $c = 12$, what is the value of $c - 2a - 2b$?

(A) -24
(B) -12
(C) 12
(D) 24
(E) It cannot be determined from the information given.

10. If m is an integer and $|2m - 2| < 1$, what is the value of m?

(A) -2
(B) -1
(C) 0
(D) 1
(E) 2

11. A barrel contains n cabbages which are either green or purple. If the probability of choosing a green cabbage at random from the barrel is 30%, which of the following represents the number of green cabbages in the barrel?

(A) $\dfrac{3n}{10}$

(B) $3n$

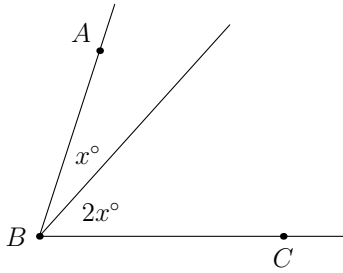(C) $\dfrac{10n}{3}$

(D) $30n$

(E) $\dfrac{100n}{3}$

12. If $3 \cdot 3^{k-1} = 81$, what is the value of k?

(A) 2
(B) 3
(C) 4
(D) 9
(E) 27

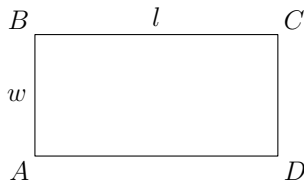**13.** If n is a positive integer and $2n^2 - n^3 = 0$, what is the value of n?

Geometry

1. In the figure above, the measure in degrees of $\angle ABC$ is $72°$. What is the value of x?

(A) $18°$
(B) $24°$
(C) $27°$
(D) $30°$
(E) $45°$

2. Rectangle $ABCD$ shown in the figure above has width w and length l that is twice the width. If $w = 2$, what is the area of the rectangle?

(A) 4
(B) 6
(C) 8
(D) 12
(E) 16

3. The area of a particular square is 16. A new square is formed by doubling the length of each side of the original square. What is the area of the new square?
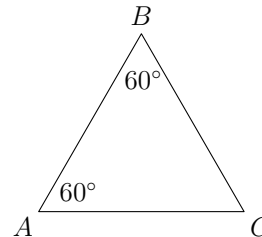
(A) 24
(B) 32
(C) 48
(D) 64
(E) 72

4. The diameter of a circle is 1. What is the area of the circle?

(A) $\dfrac{\pi}{8}$

(B) $\dfrac{\pi}{4}$

(C) $\dfrac{\pi}{2}$

(D) π

(E) 2π

5. In the xy-coordinate plane, point P is a distance of 4 from the point $(1, 1)$. Which of the following could be the coordinates of point P?

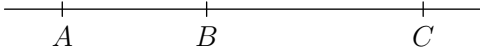(A) $(1, 2)$
(B) $(1, 5)$
(C) $(3, 1)$
(D) $(4, 1)$
(E) $(5, 5)$

6. In the figure shown above, $AC = 6$. What is the length of segment $\overline{AB}$?

(A) 3
(B) 5
(C) 6
(D) 7
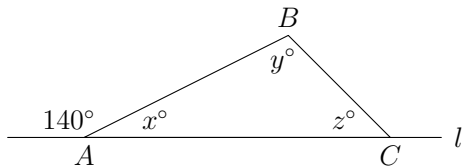(E) It cannot be determined from the information given.

7. The volume of a right circular cylinder with radius 6 is 9π. What is the height of the cylinder?

8. In the figure above, the ratio of the length of $\overline{AB}$ to the the length of $\overline{AC}$ is $2:5$. If $AC = 25$, what is the length of $\overline{AB}$?

(A)   8
(B)   10
(C)   15
(D)   18
(E)   20

9. Triangle ABC and line l are shown in the figure above. What is the sum of y and z?

(A)   40
(B)   80
(C)   120
(D)   130
(E)   140

10. In the xy-plane, the lines $6x + 3y = 7$ and $y = mx + b$ are parallel. Which of the following is the value of m?

(A) -2

(B) $-\dfrac{1}{2}$

(C)   2

(D)   6

(E)   7

11. The volume of a particular cube is 8 cubic inches. What is the surface area of the cube, in square inches?

(A)   4
(B)   12
(C)   24
(D)   32
(E)   40
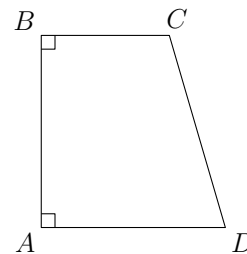
12. For trapezoid $ABCD$ shown above, $AB = 24$, $AD = 23$, and $BC = 16$. What is the length of segment $\overline{CD}$?

Data, Statistics, and Probability

1. What is the average (arithmetic mean) in degrees of the four angles in a rectangle?

   (A) 45
   (B) 75
   (C) 90
   (D) 180
   (E) 360

2. A number is to be chosen at random from among the set of integers from 1 to 9, inclusive. What is the probability that the number chosen is a multiple of 4?

   (A) $\dfrac{1}{9}$

   (B) $\dfrac{2}{9}$

   (C) $\dfrac{1}{3}$

   (D) $\dfrac{4}{9}$

   (E) $\dfrac{1}{2}$

$$12,\ a,\ 6,\ 8,\ 2,\ 14$$

3. The average (arithmetic mean) of the numbers listed above is 6. What is the value of a?

   (A) -36
   (B) -6
   (C) 0
   (D) 6
   (E) 36

WHAT IS YOUR
FAVORITE VEGETABLE?
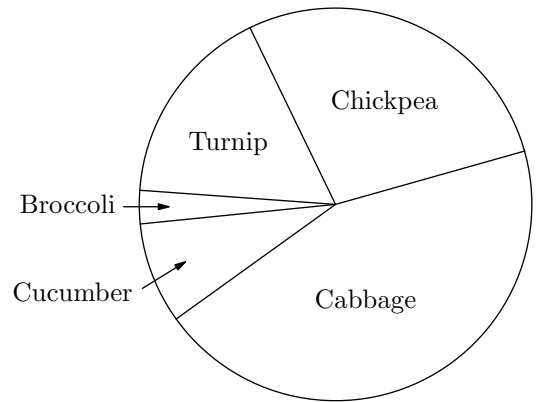
4. The circle graph above shows the results of a telephone survey. In the survey, people were asked to choose their favorite vegetable from among a group of five choices. Which of the following was chosen as favorite vegetable by approximately 40% of the people surveyed?

   (A) Broccoli
   (B) Turnip
   (C) Chickpea
   (D) Cabbage
   (E) Cucumber

FURNITURE SETS

Set	A	B	C
Tables	1	2	3
Chairs	7	5	2

PRICES

Year	2002	2007	2012
Table	$60	$80	$100
Chair	$30	$35	$40

5. A furniture company sells three sets of furniture: set A, set B, and set C. Each set consists of a different number of tables and chairs as shown in the first table above. The second table shows the sale prices in dollars of each table and chair in three different years. Based on the prices shown, what is the greatest possible sale price in dollars of a furniture set bought in 2007?

(A) $270
(B) $315
(C) $320
(D) $325
(E) $335

$$2, 10, m, 12, 4$$

6. A group of 5 integers is shown above. If the average (arithmetic mean) and median of the numbers is equal to m, what is the value of m?

(A) 7
(B) 8
(C) 9
(D) 10
(E) 11

Numbers and Operations

1. B   (Estimated Difficulty Level: 1)

If one meter equals 10 decimeters, then 12.5 meters equals $12.5 \times 10 = 125$ decimeters.

2. C   (Estimated Difficulty Level: 1+)

This question may be easiest to do with a calculator. Each purple tomato costs $1.20/5 = $0.24, and each green tomatoes costs $1.80/6 = $0.30. So, the cost of the 3 purple and 4 green tomatoes on the chair is $0.24 \times 3 + $0.30 \times 4 = $1.92.

Why not use a bowl instead of a chair? If I were a bad poet, I would probably say:

> *Katie would put those tomatoes on a chair*
> *To have a bit of fun when someone sat there!*

3. C   (Estimated Difficulty Level: 1)

Let's decode the wording: to get a term in the sequence, first multiply the previous term by 3, then subtract 3 from the result. (Why couldn't they just say it that way in the first place? Part of doing battle with the SAT makers is learning how to turn the slightly strange wording that they like to use in a math problem into something that you can easily understand.)

To get the value of n, we multiply 6 by 3, and then subtract 3 to get $6 \times 3 - 3 = 15$.

4. E   (Estimated Difficulty Level: 1+)

We need to figure out how many ounces are in each ton. Each ton equals 2000 pounds, and each pound equals 16 ounces, so each ton equals $2000 \times 16 = 32{,}000$ ounces.

But wait! Did you pick answer C? The question asked for *two* tons, not one, so the answer is 64,000 ounces, or E. Sorry about that, but the SAT makers love that kind of last-minute, extra trick at the end of a question, and they will make sure to have an answer like C just waiting for you to jump on it. Next time, stick it to them by re-reading what the question is asking for before you put your answer down.

5. E   (Estimated Difficulty Level: 2)

Percent is another way of saying "fraction": when you see 40%, you should think 40/100. The question says that 40% of the cats have brown eyes and 40% of the dogs have green eyes. Since there are 40 dogs, the answer is $40\% \times 40 = 40/100 \times 40 = 16$.

Did you calculate 40% of 30 to get 12? The number 30 in this question is extraneous (unnecessary). Just another thing to be aware of: sometimes you are given useless information in a SAT math problem.

6. D   (Estimated Difficulty Level: 2)

A good time to make up numbers! If your combination is odd, you know that the answer is incorrect. For example, $1 + 2 = 3$ so answer A is incorrect. Answer B is wrong since $2 + 4 + 5 = 11$ is odd. You'll find that answer D is always even, no matter what numbers you pick, so that is the correct answer.

7. C   (Estimated Difficulty Level: 2)

First, you must know the first few prime numbers! I'll be nice and give you the first few (2, 3, 5, 7, 11, . . .) but memorize the first ten or so for the SAT.

To make this problem easy, plug in a prime number for n. Let's say you chose $n = 5$. Then, $6n = 30$. Since 30 is not odd, prime, a multiple of 12, or equal to 12, answer C is correct.

Be careful when plugging in numbers: don't just stop at the first "correct" answer. If you get more than one answer that could be correct, you'll have to pick another number to figure out which of those answers is the right one. (For this question, if you use 2 as your first choice for n, then C, D, and E will all seem to be correct. A bit mean of me, yes, but you'll thank me later.)

8. 20   (Estimated Difficulty Level: 2)

Make a list! Alternatively, when the list seems long, try to see a pattern so that you don't have to count every single number. First, which numbers between 9 and 99 have an even tens digit? All the 20s, 40s, 60s, and 80s. Now just look at the 20s. How many of those have odd units (ones) digits? That would be 21, 23, 25, 27, and 29, which makes five numbers. It is the same for the 40s, 60s, and 80s, so the final answer is $5 \times 4 = 20$.

9. C   (Estimated Difficulty Level: 2)

In this problem, you have to count the number of combinations of Haley's bills that add up to different dollar amounts. Make a list!

$5 bills	$1 bills	Amount
0	1	$1
0	2	$2
1	0	$5
1	1	$6
1	2	$7

There are five different possible dollar amounts, making C the correct answer.

10. B   (Estimated Difficulty Level: 2)

Every sequence has a rule which tells you how to get every number in the sequence. In this problem, you are given the sequence and you have to find the rule. As with most "which of the following" questions, you need to go through the answers until you find the correct one. Here, pick a number from the sequence and see which rule gives the next number. For example, if you choose 12, then answer A gives 15, answer B gives 39, answer C gives 149, answer D gives 15, and answer E gives 6. The correct answer is B, since the next number in the sequence is 39.

If you started with 0, every rule in the answers gives the next term in the sequence (3), which is probably a bit annoying. Sorry about that; I can't imagine how that happened! Just forge ahead with another number in the sequence until you get only one correct answer.

Algebra and Functions

1. B   (Estimated Difficulty Level: 1)

Solve for x by adding 1 to both sides: $2x = 7$ so that $x = 3.5$. Then, $2x + 1 = 2 \times 3.5 + 1 = 8$ so that B is the correct answer.

But we didn't even need to do that! A common type of algebra question on the SAT doesn't ask you to solve for x, but instead asks you to find $3x$, say, or $2x + 1$ as in this problem. Here, we are given $2x - 1$. How do you get $2x + 1$ from that? Add 2 to both sides! $2x - 1 + 2 = 2x + 1 = 6 + 2 = 8$. Done! We don't even care what x is. And x doesn't care who we are since it is a pretentious celebrity variable.

2. A   (Estimated Difficulty Level: 1)

SAT math translation time! First, the sum of x and 8 is $x + 8$. Then, 3 times this sum is just $3 \times (x + 8)$ or $3(x + 8)$. You can make this problem even easier by putting in a number for x, say, 1. What is 3 times the sum of 1 and 8? Just $3 \times 9 = 27$. When you plug in $x = 1$ into the answers, only answer A will give you 27.

3. C   (Estimated Difficulty Level: 1)

One of the equations works for all five pairs of numbers; the others will work for only some of the pairs, or none at all. So we need to plug in the x and y values from the table into the equations to see which ones work. Hint: if you see a zero in a table problem like this one, use it first! When you plug in 0 for x into the answers, you get $y = -6$ only for answers A and C, so the other answers must be incorrect. (As you go, you don't need to check the incorrect answers anymore.) The next easiest number to plug in for x is probably 2. The table says we should get $y = -2$; answer A gives $y = -10$, and answer C gives us $y = -2$, so answer C is the correct one.

4. A   (Estimated Difficulty Level: 1+)

Understanding functions on the SAT is all about understanding the notation. If I were to tell you that $y = 3x + 1$ and I wanted to know what $y + 1$ is, you would just say: $y = 3x + 1$ so that $y + 1 = (3x + 1) + 1 = 3x + 2$. That problem is the same as this problem! Instead, y has been replaced by $f(x)$.

We could make this problem even easier by using a number for x, say $x = 1$. Then, $f(1) = 3(1) + 1 = 4$ so that $f(1) + 1 = 4 + 1 = 5$. Which of the answers gives us 5 when you plug in 1 for x? Only answers A and D. Plug in another number for x (say, 2) to find out which of these two answers is correct. Only answer A will always give you the correct number.

5. D   (Estimated Difficulty Level: 1)

If you can simplify the inequalities, great! You will get: $x < 4.5$ and $x > 3.\overline{66}$. Only answer D is less than 4.5 and greater than $3.\overline{66}$.

You can also solve this problem with a classic stick-it-to-the-SAT strategy: use the answers! Plug each one in for x until it works. For example, you can try answer B by setting $x = 2$. Then, $2x = 4$, which is less than 9, but $3x = 6$, which is not greater than 11, so answer B is not correct. Continue doing this until you get an answer that works.

6. C   (Estimated Difficulty Level: 1+)

Make this problem easy by using numbers for variables. For example, let's say that you rent the car for 3 days. This will cost you $40 plus $3 \times \$80$, for a total of $280. Now, set $d = 3$ and go through the answers until you get $280. The output (the y-value) of each function is the cost in dollars to rent the car. Answer A says that the cost is $f(3) = \$120$, which is not equal to $280. Only answer C gives $f(3) = \$280$, so it must be correct.

Maybe the difficult question to answer here is: Do cars from Garbanzo Auto run on vegetable oil?

7. C   (Estimated Difficulty Level: 1)

Which of the points on the graph is at the bottom of the parabola? That point will give you the minimum value of y. Since figures on the SAT are accurately drawn unless the problem says otherwise, you can see that the point $(-1, -2)$ is at the bottom of the curve. So, the needed x-value is -1. One mini-trap to avoid here is: the problem asked you for the x-value, which is -1, *not* the y-value, which is -2. Hopefully you didn't fall for answer B, which inconveniently gives the y-value. Once again, I have no idea at all how that answer got there!

8. 4   (Estimated Difficulty Level: 1+)

Hint: square both sides of the equation! When you do that, the square roots disappear and you get the equivalent equation: $2m + 1 = 3m - 3$. Solving for m gives $m = 4$.

If you were really stuck on how to proceed here, remember one of your basic SAT math strategies: *plug in numbers for variables.* Since grid-in answers are always 0 or greater, you could try plugging in 0, 1, and so forth. When the equation works, the answer must be correct.

9. B   (Estimated Difficulty Level: 2)

Occasionally, an SAT math problem will have an "E" answer that states that the problem can't be solved using the given information. For these questions, answer E is correct only about 11% of the time, using the last few years of SAT tests. So when you see one of these, you should think: "Answer E is probably a trap." And that is true for this problem as well! We don't know what a and b are, but it doesn't matter: plug in real numbers for a and b. We need $a + b = c = 12$, so I'll try $a = 5$ and $b = 7$. Then, $c - 2a - 2b = 12 - 2(5) - 2(7) = 12 - 10 - 14 = -12$, making B the correct answer.

If you are an algebra fiend, you'll see that $c - 2a - 2b = c - 2(a + b) = c - 2(c) = -c = -12$. But you don't have to be a fiend to get this question right.

10. D   (Estimated Difficulty Level: 2)

If you got stuck here, try working with the answers: substitute each answer into m until the inequality works. If you plug in answer D, you get $|2(1) - 2| = 0$ which is less than 1, so answer D is correct.

How would you do this problem the "real" way? The expression $|x| < 5$, for example, means that x is less than 5 units away from 0 on the number line. In other words, x is bigger than -5 and less than 5. In math, this is: $-5 < x < 5$. So, $|2m - 2| < 1$ is the same thing as: $-1 < 2m - 2 < 1$. Adding 2 to all sides gives $1 < 2m < 3$ so that $1/2 < m < 3/2$, which means that m must be equal to 1.

11. A   (Estimated Difficulty Level: 2)

Mmmm, there's nothing quite like a cabbage barrel. Anyway, if the algebra isn't working for you here, *plug in real numbers* for n. When it comes to percents or probabilities, numbers like 100 are good choices to plug in, so let's try $n = 100$. For the probability of choosing a green cabbage to be 30% when there are 100 cabbages in the barrel, there must be 30 green cabbages, since that number makes the probability of picking a green cabbage $30/100 = 30\%$. Now, work through the answers plugging in $n = 100$ until you get the answer 30. Answer A gives $3(100)/10 = 30$ so that must be the correct answer.

Algebra mavens and math teachers will do the following: Let x be the number of green cabbages. Then, the probability of choosing a green cabbage is x/n, which equals 30%, so that

$$\frac{x}{n} = \frac{30}{100} = \frac{3}{10}$$

and we get $x = 3n/10$. Those mavens will do this algebra smugly, but you can get the same question right just by plugging in numbers.

12. C (Estimated Difficulty Level: 2+)

Don't remember your exponent rules? Use the answers! The correct value for k must be one of the five answers, so go through them, plugging them in for k, until the equation works. For example, if $k = 3$, then the left side of the equation is $3 \cdot 3^2 = 3 \cdot 9 = 27$. Since 27 isn't equal to 81, answer B is incorrect. Also, since $27 < 81$, it is a good bet that we need k to be bigger, so answer A is probably wrong as well. You should find that when $k = 4$, the equation works, so answer C is correct.

For problems like this, it helps to know an important rule of exponents: $x^a \cdot x^b = x^{a+b}$. This means that:

$$3 \cdot 3^{k-1} = 3^1 \cdot 3^{k-1} = 3^{1+k-1} = 3^k = 81.$$

Since $3^4 = 81$, k must be equal to 4. This kind of algebra can be difficult, so don't hesitate to use the answers instead. You won't get extra points for using fancy algebra!

13. 2 (Estimated Difficulty Level: 2)

Let's try this without algebra first. For SAT math, you should know that positive integers are: 1, 2, 3, and so forth, but *not* 0, which is neither positive or negative. Now, plug in positive integers for n until the equation works! If $n = 1$, the left side is $2(1) - 1 = 1$ so the equation doesn't work. If $n = 2$, the left side is $2(2^2) - 2^3 = 2(4) - 8 = 0$ so the answer is $n = 2$.

Algebra addicts will snicker and say: "Well, you could have just factored the left-hand side." They would realize that each term on the left-hand side has a factor of n^2, so that can be factored out: $2n^2 - n^3 = n^2(2-n) = 0$ which means that either $n^2 = 0$ or $n - 2 = 0$. The first equation means that $n = 0$ and the second means that $n = 2$. However, since n is positive, only $n = 2$ is correct. Algebra addicts notwithstanding, plugging in numbers is a nice, easy way to solve this problem.

Geometry

1. B   (Estimated Difficulty Level: 1)

In the figure, $\angle ABC$ has been divided into two parts: an angle measuring $x°$ and another measuring $2x°$. So, when we add these two angles, we will get $72°$. In algebra, $x + 2x = 72$ so that $3x = 72$, resulting in $x = 24$.

2. C   (Estimated Difficulty Level: 1)

With geometry questions, it can help to put in numbers that are given to you on the figure itself. Since the width is 2 and the length is twice the width, the figure with all the side lengths shown is:

The area of the rectangle is then $2 \times 4 = 8$, making C the correct answer.

3. D   (Estimated Difficulty Level: 1)

The area of a square is the square of the length of a side. The length of any side of the original is 4, since $4^2 = 16$. The new square has sides of length $2 \times 4 = 8$, so the new square has area $8^2 = 64$.

Hint: memorize $A = (\text{side})^2$ for a square as well as $A = (\text{length}) \times (\text{width})$ for a rectangle, even though the rectangle formula is given at the front of each SAT math section. That will save time, and time is points on the SAT!

4. B   (Estimated Difficulty Level: 1+)

The area of a circle is $A = \pi r^2$. Memorize this! (See the answer to the previous question.) If the diameter d is equal to 1, then the radius is $r = d/2 = 1/2$. The area of the circle is then $\pi \cdot (1/2)^2 = \pi/4$.

Read each question carefully and know those important formulas! You don't want to be the person who forgets that the circle area formula specifies radius, not diameter, and calculates the area to be $\pi \cdot 1^2 = \pi$.

5. B   (Estimated Difficulty Level: 1+)

It may help a lot to make a figure so you can visualize what is going on:
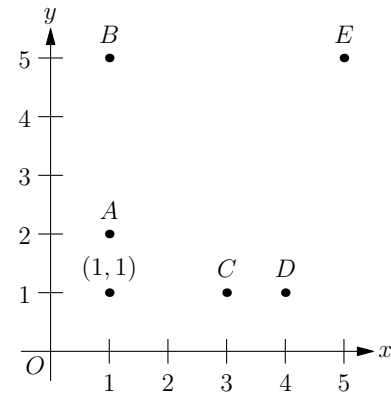
The figure above shows the point $(1, 1)$ along with the five possible answers for point P. Only answer B, point $(1, 5)$, is a distance of 4 from point $(1, 1)$: the y-value increases by 4 units to go from $(1, 1)$ to $(1, 5)$, and the x-value doesn't change.

If you know the distance formula, you could calculate the distance for each answer until you find a distance of 4, but it is rarely necessary to use this formula for the SAT.

6. C   (Estimated Difficulty Level: 1)

When two angles of a triangle are given, you can always find the third, since the angles must add up to $180°$. Here, the third angle is $180° - 60° - 60° = 60°$. This is a triangle that appears frequently on the SAT, and you should memorize it. A triangle whose angles are all $60°$ is an equilateral triangle: all of the sides are the same length. So, we know right away that the length of segment $\overline{AB}$ is 6.

7. $\dfrac{1}{4}$ or .25   (Estimated Difficulty Level: 2)

For this problem, you need to know that the volume of a right circular cylinder is $V = \pi r^2 h$. This formula is given at the beginning of each SAT math section, and circular cylinders don't appear that often, so you don't have to memorize it; just know where the formula is. Here we are given V and r and asked to find h. Using the formula: $9\pi = \pi(6)^2 h$ so that $9 = 36h$, or $h = 1/4$.

8. B   (Estimated Difficulty Level: 2)

Let the length of $\overline{AB}$ be x, and set up a proportion. Don't forget that $2:5$ is just another way of specifying the fraction $2/5$. We have:

$$\frac{AB}{AC} = \frac{x}{25} = \frac{2}{5}.$$

To solve, cross-multiply: $5x = 2 \cdot 25$ so that $x = 10$.

9. E   (Estimated Difficulty Level: 2)

First, notice that the $140°$ and $x°$ angles lie along a line, which means that they add to $180°$. This means that $x = 40$. Since $x + y + z = 180$, $40 + y + z = 180$ so that $y + z = 140$.

If you can remember the following bit of geometry, you can solve problems like this quickly. The bit is: "An exterior angle of a triangle is equal to the sum of the opposite interior angles." Here, $140°$ is the exterior angle and $y + z$ is the sum of the opposite interior angles, so $y + z = 140$. That was fast!

10. A   (Estimated Difficulty Level: 2)

To do this question, you need to remember that parallel lines always have the same slope. Also, when the equation of a line is given by $y = mx + b$, the slope is equal to m. So, we just need to find the slope of the line $6x + 3y = 7$. One way to do this is to solve for y: $3y = -6x + 7$ so that $y = -2x + (7/3)$. The slope is then -2, making answer A the correct one.

Useful SAT trick! When a line is given in the form $Ax + By = C$, the slope of the line is $-A/B$. For example, to find the slope of $6x + 3y = 7$, just divide 6 by 3 and put a minus sign in front: slope $= -6/3 = -2$. You're done!

**11.** C $\qquad$ (Estimated Difficulty Level: 2)

Some useful facts about a cube: it is a box with length, width, and height all equal. This means that the volume of a cube is $V = s^3$, where s is the length of any edge of the cube. Also, a cube has 6 square faces, each with sides of length s. So, the surface area of a cube is $6s^2$.

Now we're ready! The volume is 8, so that $s^3 = 8$, making $s = 2$. Each face has area $s^2 = 4$, so that the total surface area is $6 \cdot 4 = 24$.

12. 25 $\qquad$ (Estimated Difficulty Level: 2+)

This problem looks tricky, especially because the word "trapezoid" was used, but don't worry about that. Fill in the figure with what is given to you!
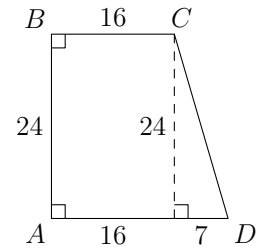
Here, I've drawn a dashed line straight down from point C perpendicular to the bottom of the trapezoid, turning it into a rectangle and triangle. Since $AD = 23$, the dashed line breaks AD into two pieces of length 16 and 7. Now, use the pythagorean theorem to find the length CD: $CD^2 = 7^2 + 24^2$ so that $CD = \sqrt{625} = 25$.

Data, Statistics, and Probability

1. C   (Estimated Difficulty Level: 1)

Each angle in a rectangle is a right angle: each measures $90°$. The average in degrees of the four angles is just $(90 + 90 + 90 + 90)/4 = 90$.

2. B   (Estimated Difficulty Level: 1)

The probability of an event is the number of ways the event can happen divided by the total number of possible outcomes. In this case, there are 9 possible outcomes (the digits from 1 to 9). There are only two multiples of 4 from 1 to 9: 4 and 8. So, the probability is $2/9$.

3. B   (Estimated Difficulty Level: 2)

Don't forget that the average of a bunch of numbers is the sum of the numbers divided by how many numbers in the bunch. We can set up an equation for the average:

$$\frac{12 + a + 6 + 8 + 2 + 14}{6} = 6.$$

Multiplying both sides by 6 gives $a + 42 = 36$, or $a = -6$.

4. D   (Estimated Difficulty Level: 2)

When making a pie chart, each "wedge" takes up the fraction of the circle equal to the percent value represented by the wedge. So, a wedge representing 40% has a central angle of $0.40 \times 360° = 144°$. Any figure on the SAT, including pie charts, is to scale unless otherwise noted. So only the cabbage portion of the pie chart could possibly be $144°$, which makes answer D the correct one. (Yes, I know, I can't believe cabbage beat out turnip for favorite vegetable either!)

5. E   (Estimated Difficulty Level: 2)

Consider furniture set A: it consists of 1 table and 7 chairs, which means that the price of set A in 2007 is $1 \times \$80 + 7 \times \$35 = \$325$. (Your calculator may be useful for problems like this one.) Similarly, the price of set B in 2007 is $2 \times \$80 + 5 \times \$35 = \$335$ and the price of set C in 2007 is $3 \times \$80 + 2 \times \$35 = \$310$. The greatest of these three is \$335, so answer E is correct.

6. A   (Estimated Difficulty Level: 2+)

Since the average of a group of numbers is the sum of the numbers divided by the number of numbers, we can make an equation:

$$\frac{2 + 10 + m + 12 + 4}{5} = m.$$

Multiplying both sides by 5 gives $m + 28 = 5m$ so that $4m = 28$, or $m = 7$. Notice that this question gave us superfluous information that m is the median. (That would normally make this problem a level 3 question, but I think you're ready for these since you've worked through the whole quiz. :)

This question had a bit of tricky algebra. Here's another solution method: use the answers by substituting them in for m until it all works. If you pick answer C, then $m = 9$ and the average of the numbers is $(2 + 10 + 9 + 12 + 4)/5 = 7.4$, which is not equal to m, so answer C is incorrect. Keep trying answers; you'll find that answer A works perfectly.