Sample Practice test for SHSAT GTSHSAT1   V1.0
– Greg / GregsTutoringNYC@gmail.com

Disclaimer: This Sample Practice test was produced by Greg's Tutoring NYC and is not
affiliated with nor endorsed by the NYC DOE in any manner. This Sample Practice test
is solely intended to be a representative datapoint and common sense guide for
families and their students who are considering taking NYCs Specialized HS Admissions
Test aka SHSAT. This sample is a mixed hybrid applicable to both SHSAT 8 and SHSAT 9.

This sample test contains 60 assorted Mathematics questions. The actual exam contains
52 Mathematics multiple-choice questions and 5 grid-ins, as well as a multiple-choice
ELA section. It is suggested that you take other practice exams before this one.

Considerations when taking this practice test:
∗ Please complete this sample test in one sitting!

∗ Start on an hour, half hour, or 15 minute point so it's easier to track time.
  Have a "dumb watch" handy to keep track of time.

∗ Be well fed and rested.
∗ Remove all distractions.
∗ Don't allocate an hour. Allocate about an hour and a half to two hours.
∗ Avoid needing to be somewhere right after taking this sample.
∗ Go to the bathroom before starting.
∗ You are not allowed to ask any questions.
∗ Nobody is allowed to tell you anything, nor help you for any reason whatsoever.
∗ Do not interact with anybody while taking this sample test.

∗ The only calculator allowed is brainpower!
∗ Turn all devices off! And move them out of sight!

∗ There is ample space on this sample test to use as scrap paper to compute your
  responses. Use additional scrap paper as necessary.
∗ On the real test your scrap computations don't matter.
  Your scrap paper is collected but not scored by the DOE.
  What does matter and is scored is your bubbled in responses.
  However, mark your answers on both in case you need to refer back.
∗ Each multiple-choice question has 4 choices: A, B, C, D, or E, F, G, H.
  Your goal is to choose THE BEST answer. "Best" may or may not be contextual.
∗ There is no penalty for guessing. However code those questions so you can
  come back to them if you still have time.

NOTE: Diagrams are not necessarily drawn to scale.
NOTE: \| mean square root, so \|4 means take the square root of 4.
NOTE: ^ means "to the power of" so 3^2 means 3 to the power of 2, yielding 9.
NOTE: The actual exam only has 4 choices for multiple choice questions!
      But for some questions in this sample test, I provide more choices.
      I have also combined questions that might otherwise be separated.

MATHEMATICS
———————————

∗∗∗ ENTER START TIME:

1. Jack and Jill went up a hill to Summit Point in Central Park. They were so tired and thirsty by the time they got there that they sat and drank a whole pail of water. After drinking so much, they realized they had to go to the bathroom. In their quest to do so they separated; Jack ended up somewhere in uptown Manhattan and Jill downtown but both of them along Park Avenue. In order to meet up again, Jack ran from Hunter College High School on East 95th Street toward East 1st Street covering 4 blocks every 6 minutes. Starting at the same time, Jill ran from East 20th Street toward East 95th Street covering 1 block every 6 minutes. Eventually they literally ran into each other whereupon Jack fell down and broke his crown and Jill came tumbling after. Which landmark is closest to the street where they crashed into each other?

(A) National Museum of Math 26th Street (B) Macy's Herald Square 34th Street (C) NY Public Library 42nd Street (D) Rockefeller Center 50th Street (E) Central Park South 59th Street

GRID-IN: If they started running at 3pm, at what time did they crash?

2. A football field is 100 yards long and 53 1/3 yards wide. An additional 10 yards for each end zone adds to the overall rectangular length dimension. A parent and their child are on opposite ends of the diagonal of the full field, and they run towards each other. The parent runs 16 feet per second and the child runs 1/4 that. How many seconds does it take for them to meet? Round the diagonal to the nearest hundred. Round your answer to the nearest second.

(A) 10 (B) 20 (C) 100 (D) 200 (E) 320

3. In the diagram below all the angles that are shown are right angles. The length of AB = 3, BC = 4, DE = 1.5 and EF = 1. What is the perimeter of the entire figure?

```
A+---+
 |   |
 |   +-----+
 | E       |
3| +-------+D
 | |
 | +-------+
 | F       |
 |    +------------+
 |                 |
B+-----------------+C
        4
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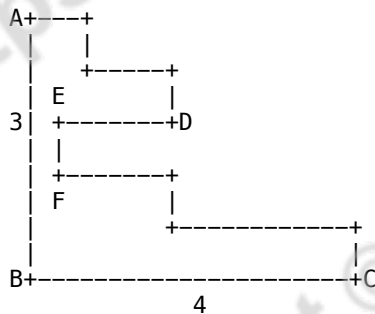
(A) 10 (B) 11 (C) 15 (D) 17 (E) 18

4. Jack is a slower runner than Kack, and Kack is a faster runner than Lack. Lack is a faster runner than both Mack and Nack. Which of the following statements is true?

(A) The slowest runner must be Jack.
(B) The slowest runner must be Mack.
(C) The slowest runner must be Nack.
(D) Either Mack or Nack must be the slowest runner.
(E) Jack, Mack, or Nack could be the slowest runner. // ALSO: Can Lack be the slowest?

5. In the "IMPORTANT NOTES" section of the Practice Test in the SHSAT Handbook item (4) reads "(4) Graphs are drawn to scale. Unless stated otherwise, you can assume relationships according to appearance. For example, lines on a graph that appear to be parallel can be assumed to be parallel. This is also true for concurrent lines, straight lines, collinear points, right angles, etc."

Most students have no idea what all these terms mean :(

Go to page 262 of the 2021 SHSAT Handbook. Many students have no idea this section exists. :(

Please have a look at problem 2, it's the problem with ∠WTL etc.

What is the total number of unique collinear points and concurrent lines in that figure?

6.

$1.\overline{1} \times 1.\overline{1}$

(A) $1.\overline{21}$ (B) $1.2\overline{1}$ (C) $1.\overline{2}$ (D) 1 19/81   (E) 1 21/100

7. The measure of the non-right angles of right triangle T shown below are in a ratio of 3:2

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|  T   \
|       \  x
■_____
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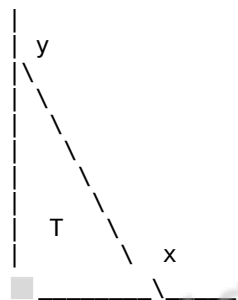
Note: Figure not drawn to scale

How many degrees is x + y?

A) 90   B) 180   C) 270   D) 360

8. The total surface area of a cube is 384.
What is the volume of a sphere of the same capacity?

A) 512   B) 512π   C) $682.\overline{6}$ D) $682.\overline{6}π$

9.

Triangle TRL is similar to triangle VWE.
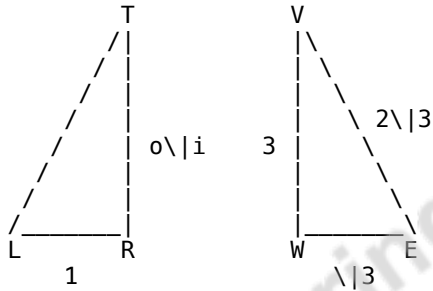
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          T              V
         /|              |\
        / |              | \
       /  |              |  \
      /   |              |   \  2\|3
     /    | o\|i    3 |      \
    /     |              |     \
   /      |              |      \
  /_____|              |_____\
  L       R              W        E
       1                      \|3
```

LR is in ratio to WE, as is TR to VW. "\|" means square root. What is o x i?

A) 1 B) 2 C) 3 D) 6 E) 9

10. If 2 popcorns and 4 drinks cost $26, and 6 popcorns and 8 drinks cost $62, how much is 6 popcorns and 12 drinks?

11. Solve for the reciprocal of:

$$\frac{X^{-2}}{\dfrac{1}{X^{-2}}}$$

if X = 2

A) −2 B) 0 C) 1 D) 2 E) 4 F) 8 G) 16 H) $\frac{1}{-2}$ I) −1 J) $\frac{1}{2}$ K) $\frac{1}{4}$ L) $\frac{1}{8}$ M) $\frac{1}{16}$

12. Two students enjoy eating some nuts during a study break. One student finds a 30% salt mixture just right while the other prefers a 15% salt mixture. How many ounces of the second student's mixture type will they have to mix in to make 60 ounces of a 20% salt nut mix as a compromise?

13. Joe's scores on the math section of various SHSAT practice tests were 90%, 80%, and 98%. If Joe wants to have a test average of 92%, what must the average of Joe's next two tests be?

(A) 94% (B) 95% (C) 96% (D) 97% (E) 100%

14. A frozen solid cube of peanut butter with side length 8 just fits perfectly into an enclosed cylinder. Assuming pi is 3.14, how much jelly needs to be added to fill all the remaining available space inside the cylinder?

15. The average of 5 consecutive even integers is 0. What is the sum of the negative difference of the greatest and least integer of this set and the positive difference of the greatest and least integer of this set?

16. Sally and Fred have a foot race at sea level with no wind. Sally runs 10 miles per hour and Fred runs half that speed. When the race starts Fred is given a 10 mile lead. At the point where and when Sally catches up to Fred they immediately turn around and race back to the finish line using the same route in reverse. After Sally crosses the finish line, Sally immediately begins to run on a circular track 330 feet long. How many revolutions does Sally make when Fred finally crosses the finish line? If needed, use 3.14 for π.

17. The width of a rectangle is the same value as the circumference of a circle with a radius of 2. The length of the same rectangle is the same value as the area of the same circle. What is the area of the rectangle divided by the perimeter of the rectangle rounded to the nearest integer?

18. What is the range of perfect squares between 144 and 1444?

19. Evaluate:

$$(.08\overline{3})^{2}$$

A) $.0069 \times 10^{-3}$ B) $.007$ C) $0.1\overline{6}$ D) 144^{-1}

20. What is the surface area to volume ratio of a sphere with a diameter that is a cube's diagonal of a cube that has a side length of \|3? (Note: \| means square root)

21. Form A of the 2020 SHSAT is 22 pages each and Form B of the 2020 SHSAT is 33 pages each. A total of 1221 forms of 34188 pages total were printed. How many Form A of the 2020 SHSAT were printed?

22. The TASHS has a htam section with different topics: citemhtira, arbegla, yrtemoeg, ytilibaborp, and scitsitats. The probability of getting a htam question in arbegla is 7 out of 11. What combination of questions is possible?

(A) 7 arbegla questions and 11 others
(B) 28 arbegla questions and 44 others
(C) 22 arbegla questions and 14 others
(D) 35 arbegla questions and 20 others

23. After grabbing a croissant for a bite to eat at a local coffee shop, Mayor de Blasio walked to Prospect Park at 4 miles per hour. At some point he got hungry again and he returned to the same coffee shop for another croissant. He returned by the same route; he was really hungry for the additional croissant so he returned at a faster pace of 6 miles per hour. What was de Blasio's average speed, in miles per hour, for the entire trip?

A) 4.8 B) 4.9 C) 5 D) 5.1

24. Mayor de Blasio, in his quest to get the perfect croissant from his favorite local coffee shop, walked 12 miles from Manhattan to Brooklyn in 2 hours. After telling Chancellor Carranza about how tasty the croissants from this shop are, Carranza decided to meet him but had to travel one third times the distance by car taking him twice as long as de Blasio's total time due to traffic. It was all fine, as de Blasio just kept eating croissants while waiting. How many times slower will it take de Blasio to get back to the same location he started from in Manhattan via his same route in reverse if he returns by car at the same speed as Carranza's speed?

A) 1/7 B) 1/6 C) 1/5 D) 1/2 E) 1 F) 2 G) 5 H) 6 I) 7

25. The Mayor and the Croissant
by Greg's Tutoring NYC

A croissant in the window of a coffee shop did see
Mayor de Blasio saying "that thing is for me!"

Into the coffee shop he went in
Only to find multiple flavors of croissants in the bin.
There were 3 chocolate, 5 raspberry and even 4 lemon,
"OMG!," he shouted "I am in croissant heaven!"
He then saw 4 more as he stared with a gaze
Yum he thought those croissants there have a glaze!
One of each he begins to hoard
thinking about his personal smorgasbord.
Speculative if this will be a win,
The coffee shop owner adds 2 more chocolate to the bin
but with a facial expression that's definitely chagrin.
But what to de Blasio's wondering eyes did appear,
but another 2 with frosting of a miniature sleigh and eight tiny reindeer.
Meandering if it will fit in the pockets of his pants
if de Blasio gets one more chocolate what's the chance?

26. Given:

  A = 99B = C −998 = D/999 > 0

Which variable in the above statement has the least value?

A) A B) B C) C D) D E) there is more than one variable

27. How much wood would Chuck, a wood chucker, have to chuck to ensure he throws an oak piece of wood if there remained 1/6 elm wood, 1/5 oak wood, and 1/4 maple wood pieces after Chuck already chucked 3 assorted pieces of wood out of 123 pieces?

A) 95 B) 96 C) 97 D) 99 E) 100

28. A poll of 600 students thought an average SHSAT cutoff score of 500 was reasonable. It turns out that a poll the year before of 500 students thought an average SHSAT cutoff score of 600 was reasonable. What is the average cutoff score thoughts across the two years of those polled?

A) 550 B) 545.$\overline{45}$ C) 1100 D) less than 550 but not enough info to determine
                                 E) more than 550 but not enough info to determine

29.   9ft
        6ft   R+---------------+I
L+---------+E | |
| | | |
| | 4ft | |
T+---------+F   H+---------------+G
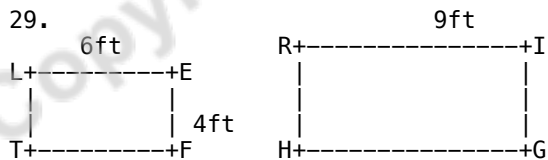
Rectangle LEFT is similar to rectangle RIGH. Which is the equivalent to the ratio of the area of LEFT to the area of RIGH?

A) .$\overline{3}$ B) .$\overline{4}$ C) $\overline{6}$ D) 1.5 E) 2.25 F) 3

30. Round 199.9 times 1999 to the nearest unit.

A) 400000 B) 399000 C) 399800 D) 399700 E) 399600

NOTE: You (should) all know how to solve this question.
      But can you do it correctly the first go through?
      Can you solve it in under 30 seconds?

31. A test has A questions. Answering a question right is worth B points. Answering
a question wrong is worth C points. Not answering a question is worth D points. If a
student answered E questions and got F of them correct, what was the student's score?
Consider A is 20, B is 5, C is 0, D is 2, E is 10 and F is 5.

32. Which of the following expressions results in an odd number?

A) 99 x 1234 B) 6543 - 4567 C) 66^2 D) 9991 / 99 E) 123 x 4567

33. A pack of Oreo's can contain 36 cookies. The package is 75% filled. A pre-k
class contains 30 kids but only 80% of the students showed up today. A teacher asked
the class who wants an Oreo and one third said they wanted one. The teacher put that
many onto a plate for them to take and eat. When the kids got up to wash their hands
the teacher finds 3 Oreo's still on the plate and so returns them into the package.
How many empty spaces does the Oreo package contain?

34. The QB99 Local bus leaves SHSAT Central every 21 minutes. The QB99 Express bus
leaves SHSAT Central every 18 minutes. If they both leave at midnight, how many times
a day do both buses leave together before finally heading to the depot?

35. The sum of four consecutive multiples of 7 yields 210. What is the sum of all the
positive factors of the third multiple?

36. To prepare a plan for SHSAT studying, a student figured they would make a tight
schedule and therefore spend one-third of their time on ELA reading comprehension,
one-sixth of their time on ELA grammar, and 12 days of their time on math multiple
choice. The student then planned to spend one-sixth of their remaining time on math
grid-ins. They felt that would leave a few days to relax at the end. There was only
one problem: when the student went through with the plan, the student ended up with

way more extra days than they wanted with twenty-five extra days unaccounted for. How many days in total did the student originally figure their plan would take?

37. Pete's Zuh sells assorted foods. Today, there is a special on rice balls: $10 each if you purchase 30 larger rice balls or $8 each if you purchase 45 smaller rice balls. They look so good! What is a fair amount of extra large rice balls to request from Pete that is in perfect alignment with his existing pricing if you want to pay $11 per extra large rice ball?

38. How many families opt for remote learning in a class of 36 if there are one-third as many families opting for in-person learning as are opting for remote learning?

39. The following chart shows my stock transactions' history:

Stock Purchases and Sales

STOCK	BUY	SELL
A	0.33	9/30
B	0.33	5/12
C	0.33	0.36
D	0.33	9/24
E	0.33	15/48

Which stock made me the least money, or if no profit, the largest loss?

40. A restaurant has been told that their usual maximum allowed customer capacity of 312 can now be only 25% of that maximum. The restaurant has been able to designate 24 tables that can accommodate either tables of 2 or tables of 4. When the restaurant is filled to capacity under this new quota, what is the maximum number of tables of 2 that can be used?

41. A number, n, is increased by 1. If the cube root of that result equals $-\sqrt{0.16}$, what is the value of n?

42. If the bases of an isosceles trapezoid are doubled and its height is halved, what impact would that have on the area of the trapezoid?

A) The area would always double
B) The area would always be half
C) The area would always increase 50%
D) The area would always decrease 50%
E) The area would always stay the same
F) There is not enough information to determine what will always be the case
G) There is not enough information to determine what will ever be the case

43. The ratio of x to y is two to three.
The ratio of z to y is 1/3 : 0.5.
If there are 4.9 items in total, how many y's are there?

44. Mayor de Blasio and Chancellor Carranza have said that SHSAT information would be released in two weeks. Today they said this for the fifth time. After each such duration, one additional week passed until they said it again. For how many weeks total have they been saying this and delaying providing information?

A) 20 B) 19 C) 18 D) 17 E) 16 F) 15 G) 14 H) 13 I) 12 J) 11 K) 10
L) 9   M) 8   N) 7   O) 6   P) 5 Q) 4 R) 3   S) 2   T) 1   U) 0
V) Unknown; it's impossible to keep track of how many times they've said it!

45. Given right triangle ABC with legs and hypotenuse as shown, what is the value of x?

```
        A
        |\
        | \
        |  \ x
x – 2   |   \
        |    \
        |_    \
        |_|____\
        B  x – 4  C
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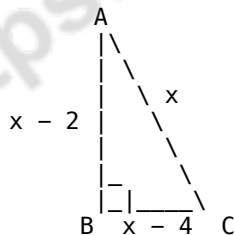
46. The square of taking i raised to the ith power is 729. What is the value of i?

47. An upright aquarium of length 10 inches, height 11 inches, and width 12 inches completely filled with water weighs 20 pounds. When the same aquarium has half the volume of water, the same aquarium and adjusted capacity of water together weigh 15 pounds. How much weight is the same empty aquarium upside down with a 5 pound rock atop the same aquarium?

48. 33 × 33 + 33 × 34 = 33 × (66 − Δ)

What is the value of Δ?

49.

```
3     1
─ = ────
x     48
      ──
       x
```

What is the smallest value of x?

50. Given that a − (b − c) = (a − x) − c

If b is a/2 and c is b/2, what is the value of x?

51. Oh snap! I placed a bet of $25 thinking the profit would be the bet squared but turns out the profit on the winnings will only be the square root of the bet. What is the positive difference between the average of these two values and the range of these two values?

52. In order to paint a 1350 m x 790 m ceiling, a rectangular tarp is placed over a moveable elevated stage with a floor size of 135 m by 79 m. The tarp accommodates an overhang past the floor size of 24 cm on each edge. After a mishap, paint got on the sides of the stage and the painters realized that they needed to add an additional 24 cm around the edges of tarp.

How many total cm is the border lengths of the additional tarp needed?

53. Set L is thus:

L = { 7, 11, 13, 16, 19, 25, 28, 31, 33, 36, 37 }

The average of the numbers within set L would be 22 except for one number which doesn't belong. Which number doesn't belong?

54. A messenger biked from Manhattan to Brooklyn at 10 miles per hour. Upon delivery

the messenger immediately returned home by the same exact route in reverse at a speed of 15 miles per hour. What was the messenger's average speed for the whole trip?

55. I can answer the revising and editing section of a test half as fast as it takes me to answer the reading comprehension section of the test, and three times as fast as the math section of the test. There are no other sections on the test. If it took me 45 minutes to double check everything and the whole test was 3 hours, how many minutes did it take me to do the revising and editing section?

56. Jar 1 and Jar 2 each contain 1/2 cup of water. If 1/4 of the water in Jar 1 is poured into Jar 2, both their water volume is increased 4-fold, and then 1/8 of a cup of water in Jar 2 is poured into Jar 1, what is the difference in water level between Jar 1 and Jar 2?

57. A parking meter will only accept thingamajig or whatchamacallit coins. A thingamajig is worth 5 and a whatchamacallit is worth 3. I need a total worth exactly 30 to park. What's the minimum number of coins I can use? And oh, note that for every 10 hours I park the required amount decreases by 1. For every hour I park over 10 hours the required amount decreases by 0.5. I intend to park for 14 hours.

58.

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|_____ |
| \       |
|  \      |
| A \     |
|_____|   length
|\   |\   |
| \C | \E |
|  \ |  \ |
| B \| D \|
|_____\
   width
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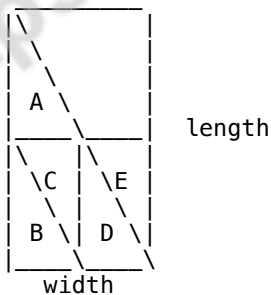
The above rectangle has a width of 6 and a length of 8. Triangles A, B, C, D, and E are congruent. What is the sum of the perimeters of all the triangles represented within the rectangle?

∗∗∗ ENTER END TIME:

You have reached the end of the Mathematics section. You may return to any part to review your work.

∗∗∗ ENTER FINAL END TIME:
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