

SATPREP
Heart of Algebra (Easy)

Easy

1. A chef has 100 slices of bread, 80 slices of ham, and 65 slices of tomato. If he needs to make sandwiches each with 2 slices of bread, 2 slices of ham, and 1 slice of tomato, find the maximum number of sandwiches he can make?
 - a) 100
 - b) 80
 - c) 65
 - d) 40
2. To make picture frames, Jen needs to cut 4 pieces of molding, each 9 inches long, to make one picture frame. She bought a 10-foot long molding to start her project. How many feet of molding will be left after she makes as many picture frames as possible?
 - a) 4
 - b) 3
 - c) 2
 - d) 1



3. When twice a number is reduced by 25, the result is 225.
What is the number?
4. During a lunch in the school cafeteria, if Kristin paid \$3.50 for her lunch from her pocket and borrowed \$1.50 from a friend, how much did she spend for this lunch?
5. A smartphone costs \$30 less than four times the cost of a basic cell phone. If the smartphone and the basic phone together cost \$570, how much more does the smartphone cost than the basic phone?
- \$216
 - \$330
 - \$415
 - \$450
6. The width of Mitchell's room is 2 feet less than its length. If the width of his room is 12 feet, what is the area of his room in square feet?
- 120
 - 140
 - 148
 - 168
7. A car rental company charges \$60 per day for the first 5 days, and \$45 a day for each day after that. How much will Tom be charged if he rents a car for two weeks?
- \$465
 - \$685
 - \$705
 - \$735
8. To find out how much time Wilson needs to spend on transportation each day to and from school, he notices that it takes 25 to 32 minutes to go to school and 30 to 45 minutes to return home. What is the range of time that Wilson needs to spend for his round trip to and from school?
- 25 minutes to 45 minutes
 - 30 minutes to 45 minutes
 - 32 minutes to 45 minutes
 - 55 minutes to 1 hour and 17 minutes

9. If x is 7 more than y , and y is 5 less than z . What is x when $z = 5$?

- a) -9
- b) -5
- c) 7
- d) 9

10. It takes between 6 and 8 minutes for Joe to run one mile up to the hill during a marathon. The amount of time it takes for him to run a mile down the hill is 2 to 3 minutes shorter than the time it takes him to run up the hill. What is the range of possible times it would take Joe to run one mile down the hill?

- a) 4 and 5 minutes
- b) 3 and 6 minutes
- c) 5 and 7 minutes
- d) 6 and 8 minutes

11. A , B , and C are three points on a line in that order. If $\overline{AB} = 25$ and \overline{BC} is 10 less than \overline{AB} , what is the length of \overline{AC} ?


- a) 40
- b) 38
- c) 35
- d) 32

12. A parking lot charges \$5.00 maintenance fee per day to use its parking space. In addition, there is a charge of \$3.25 per hour. Which of the following represents the total charge, in dollars, to park a car in the parking lot for m hours in one day?

- a) $5m + 3.25$
- b) $(5 + 3.25)m$
- c) $5 + 3.25 + m$
- d) $5 + 3.25m$

13. Mr. Jones has taught math for 8 years less than twice as long as Miss Carter. If Miss Carter has taught Math for m years, which of the following indicates the number of years that Mr. Jones has taught?

- a) $2m + 8$
- b) $m + 8$
- c) $2m - 8$
- d) $2m$

14. Triangles A, B, and C are different in size. Triangle A's area is twice the area of triangle B, and triangle C's area is four times the area of triangle A. What is the area of triangle C, in square inches, if the area of triangle B is 10 square inches?
- a) 20
 - b) 40
 - c) 60
 - d) 80
15. Mr. Smith's air conditioner is broken and it will cost \$360 to repair it. A new energy-efficient air conditioner, costing \$1200, will save Mr. Smith \$20 per month on his electric bill. If Mr. Smith decides to buy the new air conditioner, after how many months will he break even?
- a) 30
 - b) 32
 - c) 40
 - d) 42
16. John plans to work m days to earn n dollars to buy his own car. But due to his sickness, he took x days off. What is the additional amount of average salary that he must earn for the $m - x$ remaining work days in order to buy the car? 
- a) $\frac{n}{(m-x)m}$
 - b) $\frac{nx}{(m-x)m}$
 - c) $\frac{m-x}{n}$
 - d) $\frac{n(x-m)}{mx}$
17. The local route from Maya's house to her college is 4 miles longer than the expressway. When she drives by the local route and returns by the expressway, the round trip is 30 miles. How many miles does Maya have to drive if she goes to school through the expressway?
- a) 13
 - b) 15
 - c) 17
 - d) 19


18. If a rectangle of perimeter 18 has a width that is 3 less than its length, what is its area?

- a) 12
- b) 18
- c) 27
- d) 36

19. If $x^2 - 5x - 6 = 0$, what are the possible values of x ?

- a) -1, 6
- b) 1, -6
- c) -1, -6
- d) 2, -3

*Subtract 5 from y
Divide this difference by 5
Multiply this quotient by 5*

20. After completing the operations described above, which of the following is showing the result? 

- a) $\frac{y-5}{5}$
- b) $\frac{y}{5}$
- c) $\frac{y+5}{5}$
- d) $y - 5$

21. The sum of x and the square of y is equal to the square root of the difference between x and y . Which of the following mathematic expressions represents the statement above?

- a) $x + y^2 = (\sqrt{x} - y)^2$
- b) $x + \sqrt{y} = \sqrt{x - y}$
- c) $(x + y)^2 = \sqrt{x} - \sqrt{y}$
- d) $x + y^2 = \sqrt{x - y}$


22. Which of the following is an equation you would use to find x if it is given that 10 more than the product of x and 5 is 30?

- a) $5(x - 10) = 30$
- b) $5x - 10 = 30$
- c) $5(x + 10) = 30$
- d) $5x + 10 = 30$

23. Joan has \$23 and wants to buy a dozen of red pens at \$0.50 each and two dozens of blue pens at \$0.75 each. Without counting sales tax, how much more money does she need?
- a) \$1.00
 - b) \$1.75
 - c) \$1.50
 - d) \$2.00
24. $\frac{1}{5}$ of 100 is equal to what percent of 400?
- a) 5 %
 - b) 10 %
 - c) 15 %
 - d) 20 %
25. If $y > 0$, what is 25 percent of $40y$?
- a) $10y$
 - b) $12y$
 - c) $14y$
 - d) $20y$
26. A number a is multiplied by $\frac{1}{3}$. The product is then multiplied by 27, which results in 81. What is the value of a ?
- a) 3
 - b) 6
 - c) 9
 - d) 18
27. Ken, Justin, and Tiff have read a total of 65 books from the library. Justin read 3 times as many books as Ken and Tiff read 3 times as many as Justin. How many books did Ken read?
- a) 12
 - b) 9
 - c) 7
 - d) 5
28. If 0.01 percent of y is 1, what is 1 percent of y ?
- a) 1
 - b) 100
 - c) 0.1
 - d) 0.01

29. If 10 percent of 40 percent of a positive number is equal to 20 percent of y percent of the same positive number, find the value of y .

- a) 10
- b) 15
- c) 20
- d) 35

30. Which of the following is the expression that represents the statement that the value of the cube of y multiplied by the value of the square root of z , all subtracted from five-sevenths of the square of x equals x ? 


- a) $\frac{5x^2}{7} - y^3\sqrt{z} = x$
- b) $\frac{5x^2}{7} - y^2\sqrt{z} = x$
- c) $\frac{5x^2}{7} - \sqrt{y^3z} = x$
- d) $\frac{5}{7}x^2 - y^3z^2 = x$

31. When $3x$ is added to 28 and the sum is divided by 6 subtracted from x , the result equals 5. What is the value of x ?

- a) 12
- b) 18
- c) 24
- d) 29

32. If you multiply $(x - 2)$ by 5, and then divide this product by x , the result is 4. What is the value of x ?

- a) 2
- b) 10
- c) 12
- d) -10

33. Christine has y dollars to buy new videos from a video store. The member's price of any video is x dollars each. Christine needs to pay a membership fee of 25 dollars to become a member. Which of the following represents the maximum number of videos that she can buy from this video store? 

- a) $\frac{y-25}{x}$
- b) $\frac{y}{x} - 25$
- c) $xy - 25$
- d) $\frac{y}{x-25}$

34. Which of the following represents the statement "When the square of the sum of x and y is added to the sum of the squares of x and $2y$, the result is 5 less than z "?

- a) $x^2 + y^2 + (x + 2y)^2 = z - 5$
- b) $(x + y)^2 + x^2 + 2y^2 = z - 5$
- c) $(x + y)^2 + (x + 2y)^2 = z - 5$
- d) $(x + y)^2 + x^2 + (2y)^2 = z - 5$

35. After 20 customers entered a deli store and 4 customers left, there were 3 times as many customers as there were at the beginning. How many customers were in that deli store at the very beginning?

- a) 6
- b) 7
- c) 8
- d) 12

The difference of $5a$ and the square root of $2b$ is equal to the sum of the squares of $3a$ and $4b$.

36. Which of the following is an expression for the statement above?

- a) $5a - \sqrt{2b} = (3a + 4b)^2$
- b) $5a - \sqrt{2b} = (3a)^2 + (4b)^2$
- c) $5a - \sqrt{2b} = (3a)^2 + 4b$
- d) $5a - \sqrt{2b} = 3a^2 + 4b$




37. A total of x students went on a field trip transported by the number of y school buses. Each bus could seat a maximum of z students. If one bus had half of the seats empty and the remaining buses were filled, which of the following describes the relationship between x , y , and z ?



- a) $zy - \frac{1}{2}z = x$
- b) $\frac{x}{y} - \frac{1}{2}z = x$
- c) $x - \frac{1}{2}z = zy$
- d) $y - \frac{1}{2}z = x$

38. If 4 less than twice a number is equal to 20. What is 5 more than 3 times the number?

- a) 8
- b) 12
- c) 41
- d) 29

39. There was the same number of blue marbles and green marbles in a bag. After 5 blue marbles were taken out, there were twice as many green marbles as blue marbles in the bag. How many marbles were originally in the bag?
- a) 10
 - b) 15
 - c) 18
 - d) 20
40. If 25 % of m is 20, what is 15% of m ?
- a) 12
 - b) 15
 - c) 20
 - d) 24
41. If $\frac{3}{5}$ of a number is 21, what is $\frac{1}{7}$ of that number?
42. The sum of $5x$ and 3 is equal to the difference of $2x$ and 3. Which of the following represents the above statement? 
- a) $5x + 3 = 2x - 3$
 - b) $5(x + 3) = 2(x - 3)$
 - c) $5x - 3 = 2x + 3$
 - d) $5x - 3 = 2x - 3$
43. The difference of two consecutive numbers is equal to k . What is a possible value of k ? 
- a) 2
 - b) $\frac{1}{2}$
 - c) 1
 - d) -2
44. Jenny reads 10 pages of her reading every weekday and 15 pages more each day during the weekend. Which of the following represents the total pages of reading she finishes in n weeks, where n is an integer? 
- a) $30n$
 - b) $50n$
 - c) $70n$
 - d) $100n$