WS 1—SAT Overview (Sample Test 1) KEY & Scaled Score

Answers:
1. B
2. D
3. D
4. E
5. A
6. A
7. D
8. D
9. C
10. A
11. C
12. C
13. C
14. A
15. 24
16. 7
17. 8
18. 4
19. 60
20. 280

Scoring the Math SAT Sample Test 1

Check your responses with the correct answers in the column at left. Fill in the blanks below and do the calculations to get your raw scores. Use the table to find your scaled score.

How many questions did you get **correct?**
Section 1: Questions 1-10 _____
Section 2: Questions 11-14 + _____
Section 2: Questions 15-20 + _____
Total = _____**(A)**

How many multiple-choice questions did you get **wrong**?
Section 1: Questions 1-10 _____
Section 2: Questions 11-14 + _____
Total = _____
×0.25 = _____**(B)**
A – B = _____
Raw Score

Raw score rounded to nearest whole number
_____

Use the Score Conversion Table to look up your raw score to get your scaled score
_____

Score Converstion Table

RAW SCORE	SCALED SCORE
20	800
19	740
18	700
17	670
16	640
15	630
14	600
13	580
12	570
11	550
10	530
9	510
8	490
7	480
6	450
5	440
4	410
3	400
2	380
1	350
0	330
-1	290
-2	260
-3	220
-4 & below	200

Math Score……..Percentile	
800	99.5+
770-790	99.5
720-760	99
670-710	97
640-660	94
610-630	89
590-600	84
560-580	77
530-550	68
510-520	59
480-500	48
450-470	37
430-440	26
390-420	16
350-380	8
310-340	2
210-300	0.5
200	0

Detailed Solutions

1. B is correct. Translate from words to algebra

   The quotient of x and 3

   $\frac{x}{3}$

   $\frac{x}{3} - 8$ = 8 less than the quotient

   and is the required answer.

2. D is correct. It is easily seen that

   $$\frac{|x|}{|y|} = \left|\frac{x}{y}\right|$$

   For example: $\frac{|-2|}{|4|} = \left|\frac{-2}{4}\right| = \frac{1}{2}; \frac{|-3|}{|-6|} = \left|\frac{-3}{-6}\right| = \frac{1}{2}$

3. D is correct. From an isosceles triangle

   Since $AC = CD$, we know that

   $$x = y \quad [1]$$

   We also know that

   $$m\angle ACB = m\angle D + m\angle A \quad [2]$$

   Substituting the given into [2], we have

   $$110 = y + x \quad [3]$$

   Substituting [1] into [3], we get

   $$110 = y + y$$
   $$110 = 2y$$

4. E is correct. Average = $\frac{\text{sum of values}}{\text{total number of values}}$

   Let x, y = two unknown numbers.

   Thus, $\frac{28 + 30 + 32 + x + y}{} = 34$ [1]

   Multiplying [1] by 5,

   $28 + 30 + 32 + x + y = 170$

   or $90 + x + y = 170$

   or $x + y = 80$

5. A is correct. Use new definitions carefully

   Given: $\textcircled{x} = \frac{x^2}{3}$ and $\boxed{x} = \frac{9}{x}$

   Thus, $\textcircled{x} \times \boxed{x} = \frac{x^2}{3} \times \frac{9}{x} = 3x$

6. A is correct.
   It can be seen that the dark region in Choice A is Common to sets A, B, and C. Thus the diagram in Choice A describes the dark region as the set of elements that belongs to all of the sets A, B, and C.

7. D is correct. Use units/stoichiometry

   $$\left(\frac{p \text{ gallons}}{\cancel{\text{car}}}\right) \times (r \cancel{\text{ cars}}) = pr \text{ gallons for each month}$$

   $$\frac{q \cancel{\text{ gallons}}}{pr \frac{\cancel{\text{gallons}}}{\text{months}}} = \frac{q}{pr} \text{ months}$$

8. D is correct.

   Let $x, x+1, x+2, x+3, x+4$ represent the 5 consecutive integers.

   Then, $x + x + 1 + x + 2 + x + 3 + x + 4 = w$

   $$5x + 10 = w \quad [1]$$

   The next 5 consecutive positive integers will be:

   $x + 5, x + 6, x + 7, x + 8, x + 9$

   Their sum will be:

   $x + 5 + x + 6 + x + 7 + x + 8 + x + 9 =$

   $$5x + 35 \quad [2]$$

   We can write [2] as $5x + 35$

   $$= 5x + 10 + 25 \quad [3]$$

   Substituting [1] and [3], we get

   $$5x + 10 + 25 = w + 25$$

9. C is correct. Translate words to algebra.

We are told that the area of the square is twice the area of triangle. This translates to:

$$a^2 = 2\left(\frac{1}{2} \times b \times c\right) \quad [1]$$

$$a^2 = bc \quad [2]$$

We are given that $bc = 100$

Substituting [2] into [1], we get

$$a^2 = 100$$

10. A is correct.

Given that the radius of the circle = 2, we have Circumference = 2π(radius) = $2\pi(2)$

$$= 4\pi \text{ inches} \quad [1]$$

We are given that

$$\overset{\frown}{AD} + \overset{\frown}{BC} = 3\pi \text{ inches} \quad [2]$$

(Use Strategy: The whole equals the sum of its parts.)

We know that

$\overset{\frown}{AD} + \overset{\frown}{BC} + \overset{\frown}{AC} + \overset{\frown}{DB}$ = circumference of circle [3]

Substituting [1] and [2] into [3], we have

$$3\pi \text{ inches} + \overset{\frown}{AC} + \overset{\frown}{DB} = 4\pi \text{ inches}$$

$$\overset{\frown}{AC} + \overset{\frown}{DB} = \pi \text{ inches} \quad [4]$$

We know that the measure of an arc can be found by:

$$\text{measure of arc} = \left(\frac{\text{length of arc}}{\text{circumference of circle}}\right) \times 360 \quad [5]$$

Substituting [1] and [4] into [5], we get

$$\text{measure of } AC + DB = \left(\frac{\pi \text{ inches}}{4\pi \text{ inches}}\right) \times 360 = 90 \quad [6]$$

11. C is correct. Use given info carefully.

Given:

$$x + by = 5 \quad [1]$$

$$3x + y = 5 \quad [2]$$

$$y = 2 \quad [3]$$

We want to find b.

Substituting [3] into [2], we get

$$3x + 2 = 5$$

$$\text{or} \quad x = 1 \quad [4]$$

Substituting [3] and [4] into [1], we have

$$1 + 2b = 5$$

$$\text{or} \quad 2b = 4$$

$$\text{or} \quad b = 2$$

12. C is correct. Use units/stoichiometry.

Since 7 days = 1 week, 24 hours = 1 day, and 60 minutes = 1 hour, then

$$1 \text{ week} = (1 \text{ week})\left(\frac{7 \text{ days}}{\text{week}}\right)\left(\frac{24 \text{ hours}}{\text{day}}\right)\left(\frac{60 \text{ minutes}}{\text{hour}}\right)$$

$$= (7)(24)(60) \text{ minutes}$$

Thus,

$$\frac{24 \text{ minutes}}{1 \text{ week}} = \frac{24 \text{ minutes}}{(7)(24)(60) \text{ minutes}} = \frac{1}{420}$$

13. C is correct. Translate words to algebra.

$$\text{Allowance} = \$30$$

$$\text{Amount spent on candy} = \frac{2}{5} \times \$30 = \$12$$

Amount left after Johnny bought candy = \$30 − \$12 = \$18

$$\text{Amount spent on ice cream} = \frac{5}{6} \times \$18 = \$15$$

Amount left after buying candy and ice cream = \$18 − \$15 = \$3

14. A is correct.

$y = -x^2 = -4$. $x = 2$ or $x = -2$. Since point B lies on the left side of the y-axis, $x = -2$.

15. 24 Translate from words to algebra.
We are given that the wire is bent to form a circle of radius 3 feet. This means that its Length is equal to the circumference of the circle.

$$\begin{aligned}\text{Thus, Length of wire} &= 2\pi r = 2\pi(3)\text{ feet}\\ &= 6\pi\text{ feet}\\ &\approx 6(3.14)\text{ feet}\\ \text{Length of wire} &\approx 18.84\text{ feet}\end{aligned}$$ [1]

(Use Strategy: Know how to find unknown quantities.)

$$\text{Number of pieces} = \frac{\text{Total length}}{\text{2 feet long}}$$ [2]

Substituting [1] into [2], we have

$$\begin{aligned}\text{Number of pieces 2 feet long} &\approx \frac{18.84\text{ feet}}{2\text{ feet}}\\ &\approx 9.42\\ &= 9\text{ complete pieces}\end{aligned}$$

16. 7 Translate words to algebra
Let b = number of baseballs that Dick bought
t = number of tennis balls that Dick bought
$.70b$ = amount spent on baseballs
$.60t$ = amount spent on tennis balls
Thus, we are told

$$.70b + .60t = 7.00$$ [1]

Multiply [1] by 10,

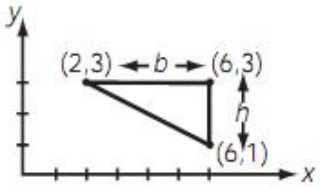
$$7b + 6t = 70$$ [2]

Solve [2] for t,

$$t = \frac{70 - 7b}{6}$$ [3]

17. 8 Use new definitions carefully.
In the given letter columns, only 8 triples have the property that exactly 2 of the letters in the triple are the same. Thus, 8 triples have a value of 1, and all the other triples have a value of 0. Hence, the value of the entire group of letter columns is 8.

18. 4 Use given info carefully.



It is clear from the diagram above that the triangle is a right triangle whose area is

$$A = \frac{1}{2}bh$$ [1]

From the given coordinates, we can also say that

$$b = 6 - 2 = 4$$ [2]

$$h = 3 - 1 = 2$$ [3]

Substituting [2] and [3] into [1],

$$A = \frac{1}{2}(4)(2)$$

$$A = 4$$

19. 60 Since we are given the radii of the circles, we have

$$AN = AM = 1$$ [1]

$$BM = BP = 2$$ [2]

$$CN = CP = 3$$ [3]

We want to find

$$(AB)(BC)(AC)$$ [4]

(Use Strategy: The whole equals the sum of its parts.) From the diagram, we see that

$$AB = AM + BM$$ [5]

$$BC = BP + CP$$ [6]

$$AC = AN + CN$$ [7]

Substituting [1], [2], [3] into [5], [6], [7] we have

$$AB = 3$$

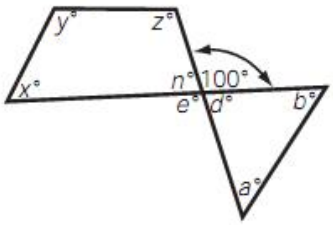
$$BC = 5$$

$$AC = 4$$

Thus,

$$\begin{aligned}(AB)(BC)(AC) &= (3)(5)(4)\\ &= 60\end{aligned}$$

20. 280 Use given info carefully & effectively.



From the diagram, $n = d$ (vertical angles) [1]

We know $x + y + z + n = 360$ [2]

Substituting [1] into [2], we get

$$x + y + z + d = 360 \quad [3]$$

Subtracting d from [3], we have

$$x + y + z = 360 - d \quad [4]$$

We know that $100 + d = 180$ from the diagram.

So, $d = 180 - 100 = 80$ [5]

Substituting [5] into [4], we get

$$x + y + z = 360 - 80$$

$$x + y + z = 280$$