Math 27 QUESTIONS

DIRECTIONS

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NOTES

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How many <u>yards</u> are equivalent to 612 inches? (1 yard = 36 inches)

- A) 0.059
- B) 17
- C) 576
- D) 22,032

1	
7	
-	

Frequency
3
16
26
73
53
29
200

The table gives the results of a survey of 200 people who were asked how often they see a movie in a theater. How many people responded either "never" or "almost never"?

- A) 24
- B) 53
- C) 82
- D) 118

3



What is the *y*-intercept of the line graphed?

- A) (0, -8)
- B) $\left(0, -\frac{1}{8}\right)$
- C) (0,0)
- D) (0,8)

4

What value of p satisfies the equation 5p + 180 = 250 ?

- A) 14
- B) 65
- C) 86
- D) 250

What is the area, in square centimeters, of a rectangle with a length of 36 centimeters and a width of 34 centimeters?

- A) 70
- B) 140
- C) 1,156
- D) 1,224

6

There are 170 blocks in a container. Of these blocks, 10% are green. How many blocks in the container are green?

7

The equation 46 = 2a + 2b gives the relationship between the side lengths *a* and *b* of a certain parallelogram. If a = 9, what is the value of *b* ?



The graph shows the possible combinations of the number of pounds of tangerines and lemons that could be purchased for \$18 at a certain store. If Melvin purchased lemons and 4 pounds of tangerines for a total of \$18, how many pounds of lemons did he purchase?

- A) 7
- B) 10
- C) 14
- D) 16

9

The area of a square is 64 square inches. What is the side length, in inches, of this square?

- A) 8
- B) 16
- C) 64
- D) 128

Connor has *c* dollars and Maria has *m* dollars. Connor has 4 times as many dollars as Maria, and together they have a total of \$25.00. Which system of equations represents this situation?

- A) c = 4mc + m = 25
- B) m = 4cc + m = 25
- C) c = 25mc + m = 4
- D) m = 25cc + m = 4

11

d = 16t

The given equation represents the distance d, in inches, where t represents the number of seconds since an object started moving. Which of the following is the best interpretation of 16 in this context?

- A) The object moved a total of 16 inches.
- B) The object moved a total of 16*t* inches.
- C) The object is moving at a rate of 16 inches per second.
- D) The object is moving at a rate of $\frac{1}{16}$ inches per second.

12

The scatterplot shows the temperature y, in °F, recorded by a meteorologist at various times x, in days since June 1.



During which of the following time periods did the greatest increase in recorded temperature take place?

- A) From x = 6 to x = 7
- B) From x = 5 to x = 6
- C) From x = 2 to x = 3
- D) From x = 1 to x = 2

13

A distance of 112 furlongs is equivalent to how many feet? (1 furlong = 220 yards and 1 yard = 3 feet)

j(x) = mx + 144

For the linear function j, m is a constant and j(12) = 18. What is the value of j(10) ?

15

$$y = 4x - 9$$
$$y = 19$$

What is the solution (x, y) to the given system of equations?

- A) (4, 19)
- B) (7, 19)
- C) (19, 4)
- D) (19,7)

16

Which expression is equivalent to $256w^2 - 676$?

- A) (16w 26)(16w 26)
- B) (8w 13)(8w + 13)
- C) (8w 13)(8w 13)
- D) (16w 26)(16w + 26)



Scientists recorded data about the ocean water levels at a certain location over a period of 6 hours. The graph shown models the data, where y = 0represents sea level. Which table gives values of *x* and their corresponding values of *y* based on the model?



C)	x	y
	0	0
	3	-12
	6	0

D)	x	y
	0	0
	12	3
	-6	0

Line *k* is defined by y = 3x + 15. Line *j* is perpendicular to line *k* in the *xy*-plane. What is the slope of line *j* ?

A)
$$-\frac{1}{3}$$

B) $-\frac{1}{12}$
C) $-\frac{1}{18}$
D) $-\frac{1}{45}$

20

A right rectangular prism has a length of 28 centimeters (cm), a width of 15 cm, and a height of 16 cm. What is the surface area, in cm², of the right rectangular prism?

21

If $3x^2 - 18x - 15 = 0$, what is the value of $x^2 - 6x$?

19

A store sells two different-sized containers of a certain Greek yogurt. The store's sales of this Greek yogurt totaled 1,277.94 dollars last month. The equation 5.48x + 7.30y = 1,277.94 represents this situation, where *x* is the number of smaller containers sold and *y* is the number of larger containers sold. According to the equation, which of the following represents the price, in dollars, of each smaller container?

- A) 5.48
- B) 7.30*y*
- C) 7.30
- D) 5.48*x*

22

Which expression is equivalent to $(d-6)(8d^2-3)$?

- A) $8d^3 14d^2 3d + 18$
- B) $8d^3 17d^2 + 48$
- C) $8d^3 48d^2 3d + 18$
- D) $8d^3 51d^2 + 48$

A right triangle has legs with lengths of 28 centimeters and 20 centimeters. What is the length of this triangle's hypotenuse, in centimeters?

A) $8\sqrt{6}$

- B) $4\sqrt{74}$
- C) 48
- D) 1,184

24

Each of the following frequency tables represents a data set. Which data set has the greatest mean?

A)	Value	Frequency
	70	4
	80	5
	90	6
	100	7

B)	Value	Frequency
	70	6
	80	6
	90	6
	100	6

C)	Value	Frequency
	70	7
	80	6
	90	6
	100	7

D)	Value	Frequency
	70	8
	80	5
	90	5
	100	8

25

$$8x + 7y = 9$$
$$24x + 21y = 27$$

For each real number *r*, which of the following points lies on the graph of each equation in the *xy*-plane for the given system?

A)	$\left(r,-\frac{8r}{7}+\frac{9}{7}\right)$
B)	$\left(-\frac{8r}{7}+\frac{9}{7},r\right)$
C)	$\left(-\frac{8r}{7}+9,\frac{8r}{7}+27\right)$
D)	$\left(\frac{r}{3}+9,-\frac{r}{3}+27\right)$

A salesperson's total earnings consist of a base salary of x dollars per year, plus commission earnings of 11% of the total sales the salesperson makes during the year. This year, the salesperson has a goal for the total earnings to be at least 3 times and at most 4 times the base salary. Which of the following inequalities represents all possible values of total sales s, in dollars, the salesperson can make this year in order to meet that goal?

A) $2x \le s \le 3x$

- B) $\frac{2}{0.11}x \le s \le \frac{3}{0.11}x$
- C) $3x \le s \le 4x$
- D) $\frac{3}{0.11}x \le s \le \frac{4}{0.11}x$

27

The number *a* is 70% less than the positive number *b*. The number *c* is 60% greater than *a*. The number *c* is how many times b ?

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There are 20 buttons in a bag: 8 white buttons, 2 orange buttons, and 10 brown buttons. If one of these buttons is selected at random, what is the probability of selecting a white button?

A)
$$\frac{2}{20}$$

B) $\frac{8}{20}$

C)
$$\frac{10}{20}$$

D) $\frac{12}{20}$

2

An employee at a restaurant prepares sandwiches and salads. It takes the employee 1.5 minutes to prepare a sandwich and 1.9 minutes to prepare a salad. The employee spends a total of 46.1 minutes preparing x sandwiches and y salads. Which equation represents this situation?

- A) 1.9x + 1.5y = 46.1
- B) 1.5x + 1.9y = 46.1
- C) x + y = 46.1
- D) 30.7x + 24.3y = 46.1

3

In a box of pens, the ratio of black pens to red pens is 8 to 1. There are 40 black pens in the box. How many red pens are in the box?

- A) 5
- B) 8
- C) 40
- D) 320

4

The function f is defined by the equation f(x) = 100x + 2. What is the value of f(x) when x = 9 ? A) 111 B) 118

- C) 900
- D) 902

5

The length, y, of a white whale was 162 centimeters (cm) when it was born and increased an average of 4.8 cm per month for the first 12 months after it was born. Which equation best represents this situation, where x is the number of months after the whale was born and y is the length, in cm, of the whale?

- A) y = 162x
- B) y = 162x + 162
- C) y = 4.8x + 4.8
- D) y = 4.8x + 162

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The perimeter of an isosceles triangle is 83 inches. Each of the two congruent sides of the triangle has a length of 24 inches. What is the length, in inches, of the third side?

7

If 2 + x = 60, what is the value of 16 + 8x?

8

The population density of Worthington is 290 people per square mile. Worthington has a population of 92,800 people. What is the area, in square miles, of Worthington?

- A) 102,400
- B) 93,090
- C) 320
- D) 32

9



What is the *y*-intercept of the graph shown?

- A) (0, -6)
- B) (-6,0)
- C) (0,0)
- D) (-5, -5)

The graph shown models the number of candy bars a certain machine wraps with a label in *x* seconds.



According to the graph, what is the estimated number of candy bars the machine wraps with a label per second?

- A) 2
- B) 40
- C) 78
- D) 80

11

In a right triangle, the measure of one of the acute angles is 51°. What is the measure, in degrees, of the other acute angle?

- A) 6
- B) 39
- C) 49
- D) 51

12

2, 9, 14, 23, 32

What is the mean of the data shown?

- A) 14
- B) 16
- C) 17
- D) 32

13

The function *f* is defined by $f(x) = 6 + \sqrt{x}$. What is the value of f(36) ?

14

x + 3y = 293y = 11

The solution to the given system of equations is (x, y). What is the value of x ?

15

On a car trip, Rhett and Jessica each drove for part of the trip, and the total distance they drove was under 220 miles. Rhett drove at an average speed of 35 miles per hour (mph), and Jessica drove at an average speed of 40 mph. Which of the following inequalities represents this situation, where r is the number of hours Rhett drove and j is the number of hours Jessica drove?

- A) 35r + 40j > 220
- B) 35r + 40j < 220
- C) 40r + 35j > 220
- D) 40r + 35j < 220

16

b = 42cf

The given equation relates the positive numbers *b*, *c*, and *f*. Which equation correctly expresses *c* in terms of *b* and *f* ?

- A) $c = \frac{b}{42f}$
- B) $c = \frac{b-42}{f}$
- C) c = 42bf
- D) c = 42 b f

17

Davio bought some potatoes and celery. The potatoes cost \$0.69 per pound, and the celery cost \$0.99 per pound. If Davio spent \$5.34 in total and bought twice as many pounds of celery as pounds of potatoes, how many pounds of celery did Davio buy?

- A) 2
- B) 2.5
- C) 2.67
- D) 4

18

In the given scatterplot, a line of best fit for the data is shown.



Which of the following is closest to the slope of this line of best fit?

- A) 7
- B) 0.7
- C) -0.7
- D) –7

Scientists collected fallen acorns that each housed a colony of the ant species *P. ohioensis* and analyzed each colony's structure. For any of these colonies, if the colony has *x* worker ants, the equation y = 0.67x + 2.6, where $20 \le x \le 110$, gives the predicted number of larvae, *y*, in the colony. If one of these colonies has 58 worker ants, which of the following is closest to the predicted number of larvae in the colony?

- A) 41
- B) 61
- C) 83
- D) 190

20

What number is 40% greater than 115?

21

For the values j and k, the ratio of j to k is 11 to 12. If j is multiplied by 17, what is k multiplied by in order to maintain the same ratio?

22

Immanuel purchased a certain rare coin on January 1. The function $f(x) = 65(1.03)^x$, where $0 \le x \le 10$, gives the predicted value, in dollars, of the rare coin *x* years after Immanuel purchased it. What is the best interpretation of the statement "f(8) is approximately equal to 82" in this context?

- A) When the rare coin's predicted value is approximately 82 dollars, it is 8% greater than the predicted value, in dollars, on January 1 of the previous year.
- B) When the rare coin's predicted value is approximately 82 dollars, it is 8 times the predicted value, in dollars, on January 1 of the previous year.
- C) From the day Immanuel purchased the rare coin to 8 years after Immanuel purchased the coin, its predicted value increased by a total of approximately 82 dollars.
- D) 8 years after Immanuel purchased the rare coin, its predicted value is approximately 82 dollars.

x	у
-6	n + 184
-3	<i>n</i> + 92
0	п

The table shows three values of x and their corresponding values of y, where n is a constant, for the linear relationship between x and y. What is the slope of the line that represents this relationship in the xy-plane?

A)
$$-\frac{92}{3}$$

B)
$$-\frac{3}{92}$$

C)
$$\frac{n+92}{-3}$$

D)
$$\frac{2n-92}{3}$$

24



The figure shown is a right circular cylinder with a radius of r and height of h. A second right circular cylinder (not shown) has a volume that is 392 times as large as the volume of the cylinder shown. Which of the following could represent the radius R, in terms of r, and the height H, in terms of h, of the second cylinder?

- A) R = 8r and H = 7h
- B) R = 8r and H = 49h
- C) R = 7r and H = 8h
- D) R = 49r and H = 8h

25

Each side of a 30-sided polygon has one of three lengths. The number of sides with length 8 centimeters (cm) is 5 times the number of sides n with length 3 cm. There are 6 sides with length 4 cm. Which equation must be true for the value of n ?

- A) 5n + 6 = 30
- B) 6n + 6 = 30
- C) 8n + 3n + 4n = 30
- D) 8(5n) + 3n + 4(6) = 30

Data set F consists of 55 integers between 170 and 290. Data set G consists of all the integers in data set F as well as the integer 10. Which of the following must be less for data set F than for data set G?

- I. The mean
- II. The median
- A) I only
- B) II only
- C) I and II
- D) Neither I nor II

27

A right circular cone has a height of 22 centimeters (cm) and a base with a diameter of 6 cm. The volume of this cone is $n\pi$ cm³. What is the value of *n* ?

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PSAT 8/9 Practice Test Worksheet: Answer Key

Mark each of your correct answers below, then add them up to get your raw score on each module.

Reading and Writing

Module 1			Module 2			
QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS	QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS	
1	С		1	С		
2	С		2	А		
3	В		3	В		
4	С		4	А		
5	В		5	D		
6	А		6	В		
7	С		7	В		
8	А		8	В		
9	А		9	D		
10	А		10	С		
11	А		11	С		
12	А		12	В		
13	С		13	D		
14	D		14	В		
15	С		15	В		
16	D		16	В		
17	С		17	В		
18	А		18	С		
19	С		19	D		
20	А		20	D		
21	D		21	С		
22	В		22	В		
23	D		23	В		
24	D		24	С		
25	А		25	D		
26	D		26	С		
27	D		27	С		
28	С		28	С		
29	А		29	А		
30	D		30	D		
31	В		31	D		
32	D		32	В		
33	В		33	А		

Math						
Module 1				Module 2		
QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS		QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	В			1	В	
2	С			2	В	
3	D			3	А	
4	А			4	D	
5	D			5	D	
6	17			6	35	
7	14			7	480	
8	В			8	С	
9	А			9	А	
10	А			10	В	
11	С			11	В	
12	С			12	В	
13	73920			13	12	
14	39			14	18	
15	В			15	В	
16	D			16	А	
17	С			17	D	
18	А			18	С	
19	А			19	А	
20	2216			20	161	
21	5			21	17	
22	С			22	D	
23	В			23	А	
24	А			24	С	
25	А			25	В	
26	В			26	D	
27	.48; 12/25			27	66	

READING AND WRITING SECTION RAW SCORE

(Total # of Correct Answers)

Module 1



Module 1

Module 2

PSAT 8/9 Practice Test Worksheet: Section and Total Scores

Conversion: Calculate Your Section and Total Scores

Enter the number of correct answers (raw scores from the previous page) for each of the modules in the boxes below and add them together to get your section raw score. Find that section raw score in the first column of the table below and then enter the corresponding lower and upper values in the two-column boxes. Add each of your lower and upper values for the test sections separately to calculate your total PSAT 8/9 score range.



Raw Score Conversion Table: Section Scores

RAW SCORE	Reading and Writing Section Score Range		Math Section Score Range		RAW SCORE	Reading and Writing Section Score Range		Math Section Score Range	
(# OF CORRECT ANSWERS)	LOWER	UPPER	LOWER	UPPER	(# OF CORRECT ANSWERS)	LOWER	UPPER	LOWER	UPPER
0	120	120	120	120	34	390	430	430	470
1	120	140	120	140	35	400	440	440	480
2	120	160	120	180	36	410	450	450	510
3	120	180	120	210	37	410	450	460	520
4	120	200	120	220	38	420	460	470	530
5	120	210	140	240	39	430	470	490	550
6	120	220	150	250	40	430	470	500	560
7	130	230	180	260	41	440	480	510	570
8	140	240	190	270	42	450	490	530	590
9	150	250	230	290	43	450	490	540	600
10	160	260	260	300	44	460	500	560	620
11	170	270	270	310	45	470	510	570	630
12	180	280	280	320	46	480	520	580	660
13	190	290	290	330	47	480	520	600	680
14	200	300	300	340	48	490	530	620	680
15	210	310	300	340	49	500	540	640	700
16	250	330	310	350	50	510	550	660	700
17	270	330	310	350	51	520	560	680	710
18	280	340	320	360	52	520	580	680	720
19	300	340	330	370	53	530	590	690	720
20	310	350	330	370	54	540	600	690	720
21	320	360	340	380	55	550	610		
22	320	360	340	380	56	560	660		
23	330	370	340	380	57	570	630		
24	340	380	350	390	58	590	650		
25	340	380	350	390	59	600	660		
26	350	390	360	400	60	620	680		
27	350	390	370	410	61	630	690		
28	360	400	380	420	62	650	710		
29	360	400	380	420	63	670	710		
30	370	410	390	430	64	690	720		
31	370	410	400	440	65	710	720		
32	380	420	410	450	66	700	720		
33	390	430	420	460					