

PSAT/NMSQT

Math

Practice Test 01



Watch



Practice



Master

Instructions

Work Through This Test Carefully

This practice test is designed to help prepare for the PSAT/NMSQT Math section.

The focus is on mathematical reasoning, problem solving, and understanding core concepts rather than calculation speed.

Each problem presents an independent challenge and can be solved without reference to the other problems.

How to Use the QR Codes

Detailed solution videos are published on YouTube over time.

- **Printed version:** Scan the QR code to open the corresponding video.
- **Digital version:** Click the QR code to open the corresponding video.

The videos can be used both while working through the problems and for review afterward.

Watch Detailed Solutions on YouTube



Math | With Erwin

This educational material was created independently and is not affiliated with any school, college, university, licensing board, testing organization, or other official institution.

Although every effort has been made to ensure accuracy, the author assumes no responsibility for errors, omissions, or the use of the information provided.

Contents

Instructions	I
Work Through This Test Carefully	I
How to Use the QR Codes.....	I
Questions.....	1
Answer Key.....	9

Questions

1

$$|x - 27| = 35$$

What is the positive solution to the equation?

- a) 8
- b) 35
- c) 62
- d) 70

2

A function g is given by $g(x) = \frac{1}{8x}$.

What is the value of $g(2)$?

- a) $\frac{1}{2}$
- b) $\frac{1}{8}$
- c) $\frac{1}{16}$
- d) $\frac{1}{10}$

3

If $x = 6$ and $y = 11 - x$, what is the value of y ?

- a) 5
- b) 6
- c) 11
- d) 17

4

A concert venue sold a total of 240 tickets for an event. Of these, 95 tickets were sold to students, and the rest were sold to adults.

How many tickets were sold to adults?

- a) 335
- b) 240
- c) 145
- d) 95

- 5** A store is offering an 18% discount on an item that originally cost \$200.
What is the discount, in dollars?
- a) 18
 - b) 36
 - c) 164
 - d) 218
- 6** A gym membership charges a one-time registration fee of \$40 and a monthly fee of \$18.
Which equation represents the total cost c , in dollars, of membership after t months?
- a) $c(t) = 18t + 40$
 - b) $c(t) = \frac{t}{18} + 40$
 - c) $c(t) = \frac{t}{40} + 18$
 - d) $c(t) = 40t + 18$
- 7**
$$32x^2 + 7x^2$$

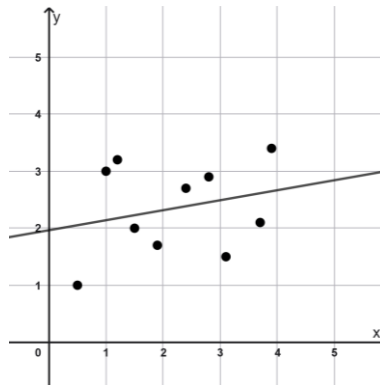
Which expression is equivalent to the expression above?
- a) $39x^4$
 - b) $224x^2$
 - c) $25x^2$
 - d) $39x^2$
- 8**
$$9x - 4x + 75 = 200$$

What is the value of x in the equation?
- 9** A factory produces parts at a constant rate of 120 parts per hour. If the factory produces a total of 48,000 parts, how many hours did the factory operate?

- 10** Solve for k : $-72k = 9$
- 11** A student must complete at least 80 practice problems before a test. The student has already completed 76 problems.
- What is the minimum number of additional problems the student needs to complete?
- a) 156
 - b) 76
 - c) 0
 - d) 4
- 12** A right triangle has a vertical leg that is 9 units long and a horizontal leg that is 30 units long. An angle x° is located at the top of the vertical leg.
- What is the value of $\tan x^\circ$?
- a) $\frac{1}{30}$
 - b) $\frac{9}{30}$
 - c) $\frac{10}{3}$
 - d) $\frac{39}{9}$
- 13** The function $N(t) = 15.2 \cdot 1.04^t$ models the predicted number of users of an online platform in millions for the years following 2010, where t represents the number of years after 2010.
- Which statement best describes the meaning of $N(5) \approx 18.5$?
- a) In 2010, the predicted number of users was approximately 5 million.
 - b) In 2010, the predicted number of users was approximately 18.5 million.
 - c) 5 years after 2010, the predicted number of users was approximately 18.5 million.
 - d) 18.5 years after 2010, the predicted number of users was approximately 5 million.

- 14** What is the y -coordinate of the point where the graph of $10x + 5y = 25$ intersects the y -axis?
- 15** Five temperatures, in degrees Fahrenheit, were recorded during a day: 72, 68, 75, 78, and 65.
What is the average temperature?
- 16** A circular garden has a radius of 31 meters.
What is the area of the garden, in square meters?
- a) $\frac{31}{2}\pi$
b) 31π
c) 62π
d) 961π
- 17** A large block of stone has a mass of 2,184 grams and a volume of 312 cubic centimeters.
What is the density of the stone, in grams per cubic centimeter?
- a) 6
b) 7
c) 8
d) 9
- 18** The equation $6x = 3(y + z)$ relates the positive numbers x , y and z .
Which equation expresses y in terms of x and z ?
- a) $y = \frac{3z}{6x}$
b) $y = 2x - z$
c) $y = 6(2x) + z$
d) $y = 2x - 3 - z$

19



The graph shows a set of data points relating x and y , as well as a trend line.

How many data points have observed y -values greater than the values predicted by the trend line?

20

Consider the system of equations:

I. $8x - 10y = 20$

II. $4x - 5y = 10$

How many solutions does this system have?

- a) One solution
- b) Two solutions
- c) Infinitely many solutions
- d) No solution

21

A data set is summarized in the table below.

Score	Number of Students
42	5
47	2
50	6
55	3

What is the lowest score in the data set?

22

An amount x is reduced so that the result is $0.4x$.

By what percent was the original amount decreased?

- a) 4%
- b) 40%
- c) 60%
- d) 96%

23

$$4x^2 - 28x - 32 = 0$$

Which value is the positive solution to the equation?

- a) $\frac{4}{7}$
- b) 4
- c) 8
- d) 28

24

The function f is defined by

$$f(x) = \frac{b-12}{x} + 7,$$

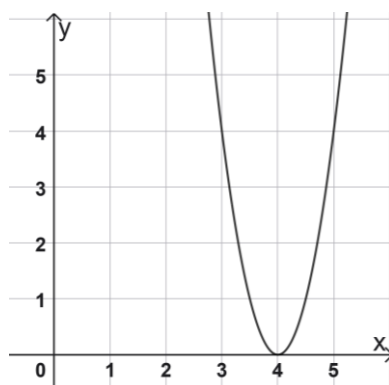
where b is a constant. The graph of $y = f(x)$ is shifted 2 units downwards and 5 units to the left to form the graph of $y = h(x)$.

Which expression represents $h(x)$?

- a) $h(x) = \frac{b-12}{x+5} + 5$
- b) $h(x) = \frac{b-12}{x-5} + 5$
- c) $h(x) = \frac{b-14}{x+5} + 7$
- d) $h(x) = \frac{b-14}{x-5} + 7$

- 25** Two positive integers have a product of 384. One of the integers is 8 greater than the other.
What is the lesser of the two integers?
- 26** In right triangle PQR , angle Q measures 90° , and $\overline{QS}$ is drawn perpendicular to $\overline{PR}$. The length of $\overline{PQ}$ is 12, and the length of $\overline{PR}$ is 20 greater than the length of $\overline{PQ}$.
What is the value of $\frac{\overline{QR}}{\overline{QS}}$?
- 27** The function g is given by
$$g(x) = (x - 5)^2 + 9$$
At which value of x does $g(x)$ attain its minimum?
- 28** What is the result of expanding $12(x^2 - 9)$?
- a) $12x^2 - 108$
 - b) $12x^2 - 21$
 - c) $12x^2 - 9$
 - d) $12x^2 + 108$
- 29** A line has equation $y = -\frac{2}{5}x + 3$. Another line is parallel to this line.
What is the slope of the second line?

30



What is the x -intercept of the graph shown?

- a) $(-5, 0)$
- b) $(5, 0)$
- c) $(-4, 0)$
- d) $(4, 0)$

Answer Key

1: c) 62	11: d) 4	21: 42
2: c) $1/16$	12: c) $10/3$	22: c) 60%
3: a) 5	13: c)	23: c) 8
4: c) 145	14: 5	24: a) $h(x) = \frac{b-12}{x+5} + 5$
5: b) 36	15: 71.6	25: 16
6: a) $c(t) = 18t + 40$	16: d) 961π	26: $8/3$
7: d) $39x^2$	17: b) 7	27: 5
8: 25	18: b) $y = 2x - z$	28: a) $12x^2 - 108$
9: 400	19: 5	29: $-2/5$
10: $-1/8$	20: c)	30: d) (4, 0)

Watch Detailed Solutions on YouTube



Found a mistake or have an idea for a new problem?

Feel free to email us at: feedback@witherwin.com



Math | With Erwin

Watch. Practice. Master.

YouTube – Watch Solutions Step by Step

Downloads – Get Additional Worksheets and Resources

www.witherwin.com