

NORTH CAROLINA EARLY MATH PLACEMENT TESTING PROGRAM

Providing a Timely Reality Check of Readiness for College-Level Mathematics

COMMONLY MISSED TEST QUESTIONS

The COVID edition

2019-2020
Test Version

data collected from 10,053
high school participants



Released Test Items from the 2019-2020 Test Version

These questions are typical of those found on actual college math placement exams throughout the UNC System, NC community colleges, and other private colleges and universities. The questions have been formatted for use as a full document, or can easily be cut in half to be used as a warm up, exit ticket, or quick challenge for high school students in Algebra II, NC Math 3, NC Math 4, Discrete Math for Computer Science, Precalculus, Statistics, and other upper-level math courses.

This test version was administered to over 10,000 students through the North Carolina Mathematics Placement Testing Center from 2019-2022. This document provides an overview of commonly missed questions from the test. To ensure it is possible to develop future tests, some content must remain secure. The released questions do not represent the full spectrum of the objectives assessed on the test, nor should it be assumed that a particular objective will be measured by an identical question in future assessments.

An answer key can be found at the end of this document. Refer to the table below for item analysis gathered from the test administration:

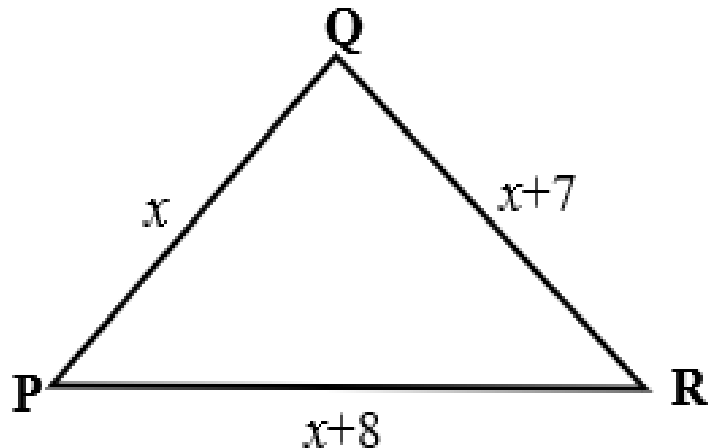
Question Number	Students Incorrect
1	71.83%
2	74.92%
3	62.39%
4	60.58%
5	65.01%
6	72.90%
7	65.93%

Question Number	Students Incorrect
8	72.64%
9	60.82%
10	58.49%
11	55.82%
12	68.60%
13	67.96%
14	63.53%

- 1 The price of propane this year is \$4.10 per gallon. If that represents a 30% increase over last year's price, what was the price of a gallon of propane last year?
- A. \$1.23
 - B. \$2.87
 - C. \$3.15
 - D. \$3.33
 - E. \$5.33

- 2 Given right triangle PQR with right angle Q , what is the area of triangle PQR ?

- A. $3x + 15$
- B. $x^2 + (x + 7)^2 = (x + 8)^2$
- C. $\frac{1}{2}x(x + 8)$
- D. $\frac{1}{2}x(x + 7)(x + 8)$
- E. $\frac{1}{2}x(x + 7)$



3 Simplify: $\frac{x^2 - 4}{5x} \cdot \frac{30}{3x - 6}$ ($x \neq 0, 2$)

A. 4

B. $2(x + 2)$

C. $\frac{2(x-2)}{2}$

D. $\frac{2(x+2)}{x}$

E. $\frac{4}{3}$

4 The graph of which of the following equations is a line that is parallel to the graph of $x - 5y = 8$?

A. $x + 5y = 8$

B. $5x - y = 8$

C. $2x + 10y = 8$

D. $2x - 10y = 8$

E. $10x - 2y = 8$

- 5 When the polynomial $4x^4 - 13x^2 - 2x + 1$ is divided by $x - 2$, what is the remainder?
- A. -23
- B. 1
- C. 3
- D. 9
- E. 17

- 6 The equation $x - \frac{3}{x} = \frac{1}{2}$ has two solutions. Find the sum of the two solutions.
- A. $-\frac{5}{2}$
- B. -2
- C. $-\frac{1}{2}$
- D. $\frac{1}{2}$
- E. $1\frac{1}{2}$

7 Solve for x : $49x^4 = 25x^2$

A. $\pm \frac{25}{49}$

B. $\pm \frac{7}{5}, 0$

C. $\pm \frac{49}{25}$

D. $\pm \frac{5}{7}, 0$

E. $\pm \frac{5}{7}$

8 The solution to the quadratic inequality $x^2 - 14x \leq 15$ is equivalent to which interval notation below?

A. $[-1, 15]$

B. $[-3, 5]$

C. $[3, 5]$

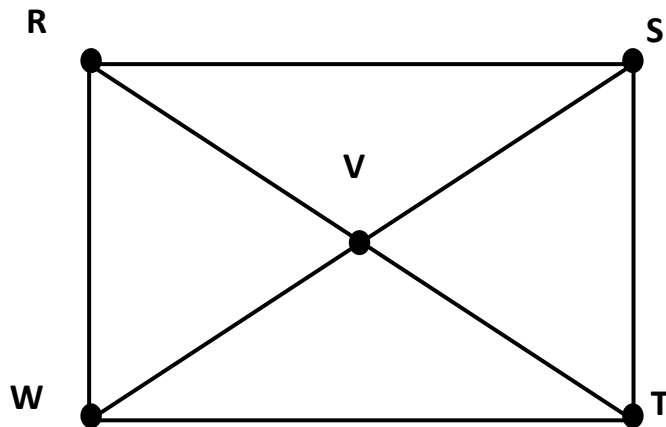
D. $(-\infty, -1] \cup [15, \infty)$

E. $(-\infty, 3] \cup [5, \infty)$

- 9 Given $f(x) = 2x^2 + x + 3$ and $g(x) = 4x^3 - 5x^2 - 7$, find $(f - g)(x)$.
- A. $-4x^3 + 7x^2 + x - 4$
 - B. $-4x^3 + 7x^2 + 10$
 - C. $-4x^3 - 3x^2 + x - 4$
 - D. $4x^3 - 7x^2 - x - 10$
 - E. $4x^3 + 7x^2 + x + 10$

- 10 In rectangle $RSTW$, $RT = 3x + 15$ and $SW = 4x - 5$. \overline{RT} and \overline{SW} intersect at point V . Find the length of \overline{WV} .

- A. 10
- B. 20
- C. 37.5
- D. 45
- E. 75



11 Multiply these complex numbers and write the answer in $ax + bi$ form:

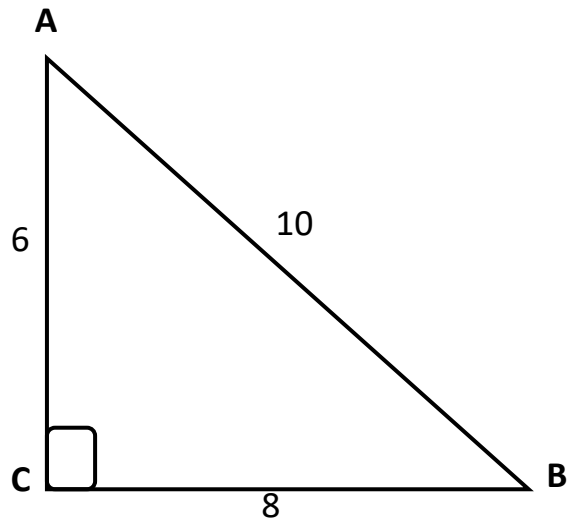
$$(-3 + 2i)(-3 - 7i)$$

- A. $-5 + 27i$
- B. $-5 + 15i$
- C. $-5 - 27i$
- D. $23 - 15i$
- E. $23 + 15i$

12 Refer to the given right triangle ABC. Find the value of this expression:

$$5\sin A + 10\cos B - 8\tan B$$

- A. 3
- B. 4
- C. 6
- D. 7
- E. 9



13

Given this system of two equations, find x :
$$\begin{cases} x + 2y = 5 \\ 4x - 6y = 9 \end{cases}$$

A. 0

B. $\frac{11}{14}$

C. 2

D. $\frac{24}{7}$

E. 5

14

Find the solution set of this equation: $\sqrt{w + 4} + 2 = w$

A. $\{0\}$ B. $\{4\}$ C. $\{5\}$ D. $\{0, 5\}$ E. $\{0, 4, 5\}$

ANSWER KEY

COMMONLY MISSED QUESTIONS

2019-2020 TEST VERSION

Question Number	Objective	Correct Answer
1	solve word problem: % increase	C
2	find area of rt triangle	E
3	multiply rational expressions	D
4	find parallel line given eq	D
5	divide a polynomial by a binomial	D
6	solve fraction eq	D
7	solve 4th degree equation by factoring	D
8	solve quadratic inequality	A
9	find the difference of two functions	B
10	use prop of rectangles to find length	C
11	multiply 2 complex numbers	E
12	simplify using rt triangle trig	C
13	solve system of 2 linear eqs	D
14	solve radical eq	C

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