

# North Carolina Early Mathematics

## Placement Testing Program –

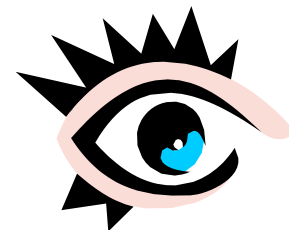
Providing a Timely Reality Check of Readiness for College-Level Mathematics

2020-2021 NC EMPT Test Version

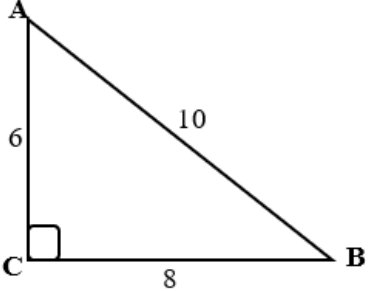
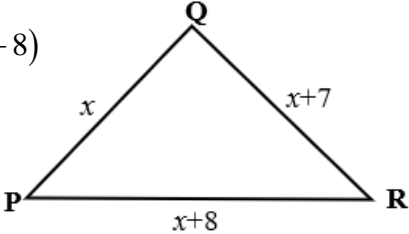
**1,183** high school student participants

(Due to the COVID-19 pandemic and the closing of high schools statewide, participation declined dramatically during 2020-2021.)

**TOP 10 MISSED**  
**Questions**



Top Ten Missed	Students Answering <b>INCORRECTLY</b>	Test Item, 2019-2020 NC EMPT Test Version
<b>1.</b> (#27 in 2019-20 test booklet)	67%	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. $(-\infty, 3] \cup [5, \infty)$
<b>2.</b> (#9 in 2019-20 test booklet)	66%	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
Top Ten Missed	Students Answering <b>INCORRECTLY</b>	Test Item, 2019-2020 NC EMPT Test Version
<b>3.</b> (#22 in	63%	The equation $x - \frac{3}{x} = \frac{1}{2}$ has two solutions. Find the <u>sum</u> of the two solutions.

2019-20 test booklet)		<p>A. <math>-\frac{5}{2}</math>      B. <math>-2</math>      C. <math>-\frac{1}{2}</math></p> <p>D. <math>\frac{1}{2}</math>      E. <math>1\frac{1}{2}</math></p>
<p><b>4.</b></p> <p>(#31 in 2019-20 test booklet)</p>	<p><b>62%</b></p>	<p>Refer to the given right triangle ABC. Find the value of this expression:</p> $5 \sin A + 10 \cos B - 8 \tan B$ <p>A. 3      B. 4      C. 6</p> <p>D. 7      E. 9</p> 
<p><b>5.</b></p> <p>(#10 in 2019-20 test booklet)</p>	<p><b>61%</b></p>	<p>Given right triangle <math>PQR</math> with right angle <math>Q</math>, what is the area of triangle <math>PQR</math>?</p> <p>A. <math>3x + 15</math>      B. <math>x^2 + (x + 7)^2 = (x + 8)^2</math></p> <p>C. <math>\frac{1}{2}x(x + 8)</math>      D. <math>\frac{1}{2}x(x + 7)(x + 8)</math></p> <p>E. <math>\frac{1}{2}x(x + 7)</math></p> 
<p>Top Ten Missed</p>	<p>Students Answering <b><u>INCORRECTLY</u></b></p>	<p>Test Item, 2019-2020 NC EMPT Test Version</p>
<p><b>6.</b></p> <p>(#24 in 2019-20 test booklet)</p>	<p><b>59%</b></p>	<p>Solve for <math>x</math>: <math>49x^4 = 25x^2</math></p> <p>A. <math>\pm\frac{25}{49}</math>      B. <math>\pm\frac{7}{5}, 0</math>      C. <math>\pm\frac{49}{25}</math></p> <p>D. <math>\pm\frac{5}{7}, 0</math>      E. <math>\pm\frac{5}{7}</math></p>

<p><b>7.</b></p> <p>(#30 in 2019-20 test booklet)</p>	<p><b>58%</b></p>	<p>Multiply these complex numbers and write the answer in <math>a + bi</math> form: <math>(-3 + 2i)(-3 - 7i)</math></p> <p>A. <math>-5 + 27i</math>      B. <math>-5 + 15i</math>      C. <math>-5 - 27i</math></p> <p>D. <math>23 - 15i</math>      E. <math>23 + 15i</math></p>
<p><b>8.</b></p> <p>(#18 in 2019-20 test booklet)</p>	<p><b>57%</b></p>	<p>When the polynomial <math>4x^4 - 13x^2 - 2x + 1</math> is divided by <math>x - 2</math>, what is the remainder?</p> <p>A. <math>-23</math>      B. <math>1</math>      C. <math>3</math></p> <p>D. <math>9</math>      E. <math>17</math></p>
<p><b>9.</b></p> <p>(#12 in 2019-20 test booklet)</p>	<p><b>54%</b></p>	<p>Simplify: <math>\frac{x^2 - 4}{5x} \cdot \frac{30}{3x - 6}</math> (<math>x \neq 0, 2</math>)</p> <p>A. <math>4</math>      B. <math>2(x + 2)</math>      C. <math>\frac{2(x - 2)}{x}</math></p> <p>D. <math>\frac{2(x + 2)}{x}</math>      E. <math>\frac{4}{3}</math></p>
<p>Top Ten Missed</p>	<p>Students Answering <b><u>INCORRECTLY</u></b></p>	<p>Test Item, 2019-2020 NC EMPT Test Version</p>
<p><b>10.</b></p> <p>(#28 in 2019-20 test booklet)</p>	<p><b>53%</b></p>	<p>Find the solution set of this equation: <math>\sqrt{w + 4} + 2 = w</math></p> <p>A. <math>\{0\}</math>      B. <math>\{4\}</math>      C. <math>\{5\}</math></p> <p>D. <math>\{0, 5\}</math>      E. <math>\{0, 4, 5\}</math></p>

**The average score for the 1,183 high school participants on the 2019-2020 NC EMPT test version administered in 2020-2021 was 18.7 out of 32 questions, or 58%.**

**Correct Answers to the Top Ten Missed Questions, 2020-2021**

**1. A    2. C    3. D    4. C    5. E    6. D    7. E    8. D    9. D    10. C**