AMERICAN RIVER COLLEGE
ASSESSMENT CENTER
Math COMPASS TEST
SAMPLE ITEMS

These items are not actual items from COMPASS® but are similar in content and format. These items are presented for illustrative purposes and do not constitute a full representation of item content.

Numerical Skills/Pre-Algebra Placement

Averages: Means, Medians, and Modes
1. What is the average (arithmetic mean) of 8, 7, 7, 5, 3, 2, and 2?  
   A. 3  
   B. 4  
   C. 4  
   D. 5  
   E. 6  

Basic Operations with Decimals
2. Ben is making wooden toys for the next arts and crafts sale. Each toy costs Ben $1.80 to make. If he sells the toys for $3.00 each, how many will he have to sell to make a profit of exactly $36.00?  
   A. 12  
   B. 20  
   C. 30  
   D. 60  
   E. 108  

Basic Operations with Fractions
3. How many yards of material from a 24-yard length of cloth remain after 3 pieces, each 3/2 yards long, and 5 pieces, each 2 1/4 yards long, are removed?  
   A. 2  
   B. 4  
   C. 4  
   D. 10  
   E. 10  

Percentages
4. Phillip charged $400 worth of goods on his credit card. On his first bill, he was not charged any interest, and he made a payment of $20. He then charged another $18 worth of goods. On his second bill a month later, he was charged 2% interest on his entire unpaid balance. How much interest was Phillip charged on his second bill?  
   A. $8.76  
   B. $7.96  
   C. $7.60  
   D. $7.24  
   E. $6.63  

Algebra Placement

Elementary Algebra: Linear Equations in One Variable
1. A student has earned scores of 87, 81, and 88 on the first 3 of 4 tests. If the student wants an average (arithmetic mean) of exactly 87, what score must she earn on the fourth test?  
   A. 85  
   B. 86  
   C. 87  
   D. 92  
   E. 93  

Elementary Algebra: Basic Operations with Polynomials
2. Which of the following expressions represents the product of 3 less than twice x and 2 more than the quantity 3 times x?  
   A. –6x² + 25x + 6  
   B. 6x² + 5x + 6  
   C. 6x² – 5x + 6  
   D. 6x² – 5x – 6  
   E. 6x² – 13x – 6  

Elementary Algebra: Substituting Values into Algebraic Expressions
3. If x = –1 and y = 2, what is the value of the expression 2x³ – 3xy?  
   A. 8  
   B. 4  
   C. –1  
   D. –4  
   E. –8  

Intermediate Algebra: Rational Expressions
4. For all nx ± 2,  
   \[ \frac{r² - 3x + 6}{r² + 4} = ? \]  
   A. \[ \frac{r + 3}{r - 2} \]  
   B. \[ \frac{r + 2}{r - 3} \]  
   C. \[ \frac{r + 3}{r + 3} \]  
   D. \[ \frac{r - 2}{r + 3} \]  
   E. \[ \frac{r + 2}{r + 2} \]  

Coordinate Geometry: Linear Equations in Two Variables
5. What is the equation of the line that contains the points with (x,y) coordinates (–3,7) and (5,–1) ?  
   A.  
   B.  
   C.  
   D.  
   E.  

College Algebra Placement

Complex Numbers

1. For \( i = \sqrt{-1} \), if \( 3i(2 + 5i) = x + 6i \), then \( x = ? \)
   - A. \(-15\)
   - B. \(5\)
   - C. \(5i\)
   - D. \(15i\)
   - E. \(27i\)

Functions

2. If \( f(4) = 0 \) and \( f(6) = 6 \), which of the following could represent \( f(x) \)?
   - A. \(\frac{2}{3}x - 4\)
   - B. \(x + 2\)
   - C. \(x - 4\)
   - D. \(2x + 6\)
   - E. \(3x - 12\)

Answers: 1. A; 2. E

Trigonometry Placement

Trigonometric Functions and Identities

1. Which of the following is equivalent to \( \frac{1 - \cos^2\theta}{\cos^2\theta} \)?
   - A. \(\sec^2\theta\)
   - B. \((\csc^2\theta) - 1\)
   - C. \(\tan^2\theta\)
   - D. \(\sin^2\theta\)
   - E. \(\frac{1}{\sin^2\theta}\)

Right-Triangle Trigonometry

2. From a point on the ground the angle of elevation to a ledge on a building is \(27^\circ\), and the distance to the base of the building is 45 meters. How many meters high is the ledge?
   - A. \(\frac{45}{\sin 27^\circ}\)
   - B. \(\frac{45}{\tan 27^\circ}\)
   - C. \(45 \sin 27^\circ\)
   - D. \(45 \cos 27^\circ\)
   - E. \(45 \tan 27^\circ\)

Answers: 1. C; 2. E