1. The slope of the line through points A(3,–2) and B(–2,–3) is (A) −5 (B) − 1/5 (C) 1/5 (D) 1 (E) 5

2. The slope of line 8x + 12y + 5 = 0 is (A) -3/2 (B) -2/3 (C) 2/3 (D) 2 (E) 3

3. The slope of the line perpendicular to line 3x – 5y + 8 = 0 is (A) -5/3 (B) -3/5 (C) 3/5 (D) 5/3 (E) 3

4. The y-intercept of the line through the two points whose coordinates are (5,–2) and (1,3) is (A) -5/4 (B) 5/4 (C) 17/4 (D) 7 (E) 17

5. The equation of the perpendicular bisector of the segment joining the points whose coordinates are (1,4) and (–2,3) is (A) 3x – 2y + 5 = 0 (B) x – 3y + 2 = 0 (C) 3x + y – 2 = 0 (D) x – 3y + 11 = 0 (E) x + 3y – 10 = 0

6. The length of the segment joining the points with coordinates (–2,4) and (3,–5) is (A) 2.8 (B) 3.7 (C) 10.0 (D) 10.3 (E) none of these

7. The slope of the line parallel to the line whose equation is 2x + 3y = 8 is (A) –2 (B) -3/2 (C) -2/3 (D) 2/3 (E) 3/2

8. If the graph of is perpendicular to the graph of ax + 3y + 2 = 0, then a = (A) – 4.5 (B) –2.22 (C) –1.35 (D) 0.45 (E) 1.35

1. The coordinates of the vertex of the parabola whose equation is y = 2x2 + 4x – 5 are (A) (2, 11) (B) (–1, –7) (C) (1, 1) (D) (–2, –5) (E) (–4, 11)

2. The range of the function = {(x,y):y = 5 – 4x – x2 } is (A) {y:y 0} (B) {y:y –9} (C) {y:y 9} (D) {y:y 0} (E) {y:y 1}

3. The equation of the axis of symmetry of the function y = 2x2 + 3x – 6 is (A) x = -3/2 (B) x = -3/4 (C) x=-1/3 (D) x=1/3 (E) x=3/4

4. Find the zeros of y = 2x2 + x – 6. (A) 3 and 2 (B) –3 and 2 (C) 1/2 and 3/2 (D) -3/2 and 1 (E) 3/2 and –2

5. The sum of the zeros of y = 3x2 – 6x – 4 is (A) –2 (B) -4/3 (C) 4/3 (D) 2 (E) 6

6. x2 + 2x + 3 = 0 has (A) two real rational roots (B) two real irrational roots (C) two equal real roots (D) two equal rational roots (E) two complex conjugate roots

7. A parabola with a vertical axis has its vertex at the origin and passes through point (7,7). The parabola intersects line y = 6 at two points. The length of the segment joining these points is (A) 14 (B) 13 (C) 12 (D) 8.6 (E) 6.5

1. P(x) = ax4 + x3 – bx2 – 4x + c. If P(x) increases without bound as x increases without bound, then, as x decreases without bound, P(x) (A) increases without bound (B) decreases without bound (C) approaches zero from above the x-axis (D) approaches zero from below the x-axis (E) cannot be determined

2. Which of the following is an odd function? I. f(x) = 3x3 + 5 II. g(x) = 4x6 + 2x4 – 3x2 III. h(x) = 7x5 – 8x3 + 12x (A) only I (B) only II (C) only III (D) only I and II (E) only I and III

3. How many possible rational roots are there for 2x4 + 4x3 – 6x2 + 15x – 12 = 0? (A) 4 (B) 6 (C) 8 (D) 12 (E) 16

4. If both x – 1 and x – 2 are factors of x3 – 3x2 + 2x – 4b, then b must be (A) 0 (B) 1 (C) 2 (D) 3 (E) 4

5. If 3x3 – 9x2 + Kx – 12 is divisible by x – 3, then K = (A) –40 (B) –3 (C) 3 (D) 4 (E) 22

6. Write the equation of lowest degree with real coefficients if two of its roots are –1 and 1 + i. (A) x3 + x2 + 2 = 0 (B) x3 – x2 – 2 = 0 (C) x3 – x + 2 = 0 (D) x3 – x2 + 2 = 0 (E) none of the above

1. Which of the following is equivalent to 3 x2 – x < 2? (A) -3/2 < x < 1 (B) -1 < x < 2/3 (C) -2/3 < x < 1 (D) -1 < x < 3/2 (E) x < -2/3 or x > 1

2. Solve x5 – 3 x3 + 2 x2 – 3 > 0. (A) ( , – 0.87) (B) (–1.90,–0.87) (C) (–1.90,–0.87) U (1.58 , ) (D) (–0.87,1.58) (E) ( 1.58 , )

3. The number of integers that satisfy the inequality x2 + 48 < 16x is (A) 0 (B) 4 (C) 7 (D) an infinite number (E) none of the above