Math 1314 - Practice Exam 3 - Spring 19

MULTIPLE CHOICE SECTION. (5 pts each) Choose the correct answer for each question. Select one choice only. No work will be graded. No partial credit.

Find the distance between the pair of points.

1) (1, –1) and (–3, 5) 1) _____

A) $20\sqrt{5}$ B) 10 C) 20 D) $2\sqrt{13}$

Find the midpoint of the line segment whose end points are given.

2) $(\frac{5}{4}, -\frac{8}{5})$ and $(\frac{9}{4}, \frac{9}{5})$ 2) _____

A) $(-\frac{1}{2}, -\frac{17}{10})$ B) $(\frac{7}{4}, \frac{1}{10})$ C) $(\frac{7}{2}, \frac{1}{5})$ D) $(\frac{1}{2}, \frac{17}{10})$

Write the standard form of the equation of the circle with the given center and radius.

3) (3, 5); $\sqrt{19}$ 3) _____

A) $(x - 5)^2 + (y - 3)^2 = 361$ B) $(x + 3)^2 + (y + 5)^2 = 19$

C) $(x + 5)^2 + (y + 3)^2 = 361$ D) $(x - 3)^2 + (y - 5)^2 = 19$

Use synthetic division to find the quotient and the remainder.

4) $(2x^5 - x^4 + 3x^2 - x + 5) \div (x - 1)$ 4) _____

A) $Q(x) = (2x^4 + x^3 + x^2 + 4x + 3)$; $R(x) = 8$ B) $Q(x) = (2x^4 + x^3 + 4x^2 + 3x)$; $R(x) = 8$

C) $Q(x) = (2x^4 - 3x^3 - x)$; $R(x) = 6$ D) $Q(x) = (2x^4 + x^3 - x^2 + 2x + 1)$; $R(x) = 6$

5) $(x^4 - 5) \div (x - 3)$ 5) _____

A) $Q(x) = x^3 + 3x^2 + 9x + 27$; $R(x) = 76$ B) $Q(x) = x^3 + 5x^2 + 25x + 125$; $R(x) = 622$

C) $Q(x) = x^3 + 3x^2 + 9x + 27$; $R(x) = 622$ D) $Q(x) = x^3 + 7x^2 + 6x + 3$; $R(x) = 76$

Solve the problem.

6) Solve the equation $12x^3 - 65x^2 + 24x + 10 = 0$ given that $\frac{2}{3}$ is a root. 6) _____

A) $\left\{\frac{2}{3}, \frac{1}{4}, -5\right\}$ B) $\left\{\frac{2}{3}, -\frac{5}{4}, 1\right\}$ C) $\left\{\frac{2}{3}, -\frac{1}{4}, 5\right\}$ D) $\left\{\frac{2}{3}, \frac{5}{4}, -1\right\}$

Use the Rational Zero Theorem to list all possible rational zeros for the given function.

7) $f(x) = 6x^4 + 4x^3 - 2x^2 + 2$ 7) _____

A) $\pm\frac{1}{6}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm 1, \pm 2$ B) $\pm\frac{1}{6}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm\frac{2}{3}, \pm 1, \pm 2$

C) $\pm\frac{1}{2}, \pm\frac{3}{2}, \pm 1, \pm 2, \pm 3, \pm 6$ D) $\pm\frac{1}{6}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm\frac{2}{3}, \pm 1, \pm 2, \pm 3$

Find an nth degree polynomial function with real coefficients satisfying the given conditions.

8) n = 4; 2i, 4, and –4 are zeros; leading coefficient is 1 8) _____

A) $f(x) = x^4 + 4x^2 - 64$ B) $f(x) = x^4 - 12x^2 - 64$

C) $f(x) = x^4 + 4x^2 - 4x - 64$ D) $f(x) = x^4 + 4x^3 - 12x^2 - 64$

State the domain of the rational function.

9) $f(x) = \dfrac{x^2 + 4x - 12}{x^2 - 5x - 14}$ 9) _____

A) $(-\infty, -2) \cup (-2, 7) \cup (7, \infty)$ B) $(-\infty, 7) \cup (7, \infty)$

C) $(-\infty, \infty)$ D) $(-\infty, -7) \cup (-7, 2) \cup (2, \infty)$

Find the vertical asymptotes, if any, of the graph of the rational function.

10) $h(x) = \dfrac{x + 6}{x^2 - 36}$ 10) _____

A) $x = 6, x = -6$ B) $x = -6$

C) $x = 6$ D) no vertical asymptote

Find the horizontal asymptote, if any, of the graph of the rational function.

11) $g(x) = \dfrac{2x^2 - 4x - 7}{7x^2 - 7x + 5}$ 11) _____

A) $y = 0$ B) $y = \dfrac{4}{7}$

C) $y = \dfrac{2}{7}$ D) no horizontal asymptote

12) $f(x) = \dfrac{-10x}{2x^3 + x^2 + 1}$ 12) _____

A) $y = 0$ B) $y = -\dfrac{1}{5}$

C) $y = -5$ D) no horizontal asymptote

SHORT ANSWER SECTION. (5 pts each) Write the answer in the box. Write the FINAL ANSWER ONLY. No work will be graded. No partial credit.

Find the distance between the pair of points.

13) (0, –1) and (8, –1) 13) _____

Find the center and the radius of the circle.

14) $x^2 + y^2 - 4x - 8y + 11 = 0$ 14) _____

Find the requested polynomial.

15) Find a polynomial function of degree 3 with -5 , 0 , $\frac{1}{2}$ as zeros. 15) _____

State the domain of the rational function.

16) $f(x) = \frac{x - 4}{x^2 + 7}$ 16) _____

Find the horizontal asymptote, if any, of the graph of the rational function.

17) $h(x) = \frac{8x^3}{2x^2 + 1}$ 17) _____

Find the vertical asymptote(s) of the graph of the given function.

18) $f(x) = \frac{x - 9}{x^2 + 5}$ 18) _____

ESSAY. (5 pts each) Show all work to justify your answer. Answer with no work or insufficient work will receive no credit. Partial credit may be given.

Given that the polynomial function has the given zero, find the other zeros.

19) $f(x) = x^3 - 2x^2 - 11x + 52;\ -4$

Complete the square and write the equation in standard form. Then give the center and radius of the circle.

20) $x^2 + y^2 - 6x + 6y + 7 = 0$

Answer Key
Testname: 1314-PRACTICETEST3-SPR19-WITHKEY

1) D
2) B
3) D
4) A
5) A
6) C
7) B
8) B
9) A
10) C
11) C
12) A
13) 8
14) (2, 4); $r = 3$
15) $f(x) = x^3 + \frac{9}{2}x^2 - \frac{5}{2}x$
16) $(-\infty, \infty)$
17) no horizontal asymptote
18) None
19) $3 + 2i, 3 - 2i$
20) $(x - 3)^2 + (y + 3)^2 = 11$
$(3, -3)$, $r = \sqrt{11}$