Practice Exam 2 - 1314 Online - Spr18

MULTIPLE CHOICE. (5pts each) Choose the one alternative that best completes the statement or answers the question. Write your choice in the space provided. No work will be graded. No partial credit.

Find the domain of the function.

1) $\frac{x}{\sqrt{x - 10}}$ 1) _____

A) $(-\infty, \infty)$ B) $(10, \infty)$ C) $[10, \infty)$ D) $(-\infty, 10) \cup (10, \infty)$

For the given functions f and g , find the indicated composition.

2) $f(x) = \frac{2}{x + 5}$, $g(x) = \frac{7}{2x}$ 2) _____

$(f \circ g)(x)$

A) $\frac{4x}{7 - 10x}$ B) $\frac{7x + 35}{4x}$ C) $\frac{2x}{7 + 10x}$ D) $\frac{4x}{7 + 10x}$

The given function is one-to-one. Find $f^{-1}(x)$.

3) $f(x) = \frac{7x + 2}{5}$ 3) _____

A) $f^{-1}(x) = \frac{5x - 2}{7}$ B) $f^{-1}(x) = \frac{5}{7x - 2}$ C) $f^{-1}(x) = \frac{5}{7x + 2}$ D) $f^{-1}(x) = \frac{5x + 2}{7}$

Find the distance between the pair of points.

4) (-6, -5) and (3, -2) 4) _____

A) $72\sqrt{2}$ B) 72 C) 6 D) $3\sqrt{10}$

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

5) $(3, 8); \sqrt{19}$ 5) _____

A) $(x - 8)^2 + (y - 3)^2 = 361$ B) $(x + 8)^2 + (y + 3)^2 = 361$

C) $(x - 3)^2 + (y - 8)^2 = 19$ D) $(x + 3)^2 + (y + 8)^2 = 19$

Find the coordinates of the vertex for the parabola defined by the given quadratic function.

6) $f(x) = x^2 - 10x - 7$ 6) _____

A) (5, -82) B) (-10, 193) C) (5, -32) D) (-5, 68)

Solve the problem.

7) The profit that the vendor makes per day by selling x pretzels is given by the function $P(x) = -0.004x^2 + 2.4x - 400$. Find the number of pretzels that must be sold to maximize profit. 7) _____

A) 300 pretzels B) 1.2 pretzels C) -40 pretzels D) 600 pretzels

Determine the end behavior of the polynomial function.

8) $f(x) = -6x^3(x + 1)(x + 4)^2$ 8) _____

A) rises to the left and falls to the right B) rises to the left and rises to the right

C) falls to the left and falls to the right D) falls to the left and rises to the right

Find the zeros for the polynomial function and give the multiplicity for each zero. State whether the graph crosses the x-axis or touches the x-axis and turns around, at each zero.

9) $f(x) = 3(x + 2)(x + 5)^2$ 9) _____

A) -2, multiplicity 1, crosses x-axis; -5, multiplicity 2, touches x-axis and turns around
B) -2, multiplicity 1, touches x-axis and turns around; -5, multiplicity 2, crosses x-axis
C) 2, multiplicity 1, crosses x-axis; 5, multiplicity 2, touches x-axis and turns around
D) 2, multiplicity 1, touches x-axis and turns around; 5, multiplicity 2, crosses x-axis

Use synthetic division to find the quotient and the remainder.

10) $(x^3 - x^2 + 5) \div (x + 2)$ 10) _____

A) $Q(x) = (3x^2 - 4x + 2)$; $R(x) = 7$
B) $Q(x) = (x^2 - 3x + 6)$; $R(x) = 2$
C) $Q(x) = (x^2 + x + 2)$; $R(x) = -7$
D) $Q(x) = (x^2 - 3x + 6)$; $R(x) = -7$

SHORT ANSWER. (5pts each) Write the answer in the space provided. No work will be graded. No partial credit.

Find f(x) and g(x) such that $h(x) = (f \circ g)(x)$.

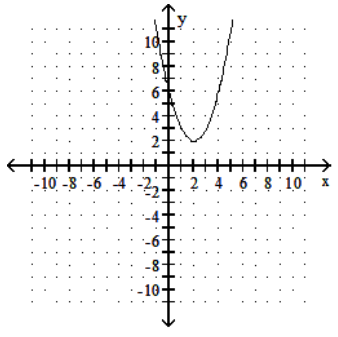
11) $h(x) = \dfrac{3}{\sqrt{8x + 7}}$ 11) _____

Decide whether or not the functions are inverses of each other.

12) $f(x) = \dfrac{1 + x}{x}$, $g(x) = \dfrac{1}{x - 1}$ 12) _____

The graph of a quadratic function is given. Determine the function's equation.

13) 13) _____



Use synthetic division to find the quotient and the remainder.

14) $(x^3 - 3) \div (x - 1)$ 14) _____

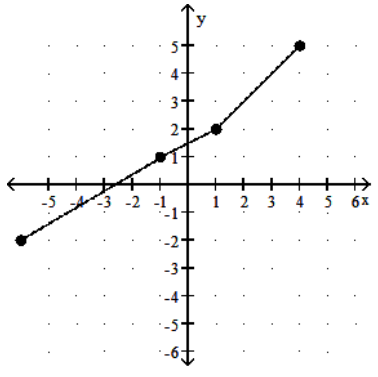
ESSAY. (6pts each) Show all work to justify your answer. Answer with no work or insufficient work will receive no credit. Partial credit may be given for correct work.

Find the domain of the composite function $f \circ g$.

15) $f(x) = \frac{8}{x + 8}$, $g(x) = \frac{8}{x}$

The graph of a one-to-one function f is given. Sketch the graph of the inverse function f^{-1}, on the same set of axes. Use a dashed line for the inverse.

16)



Solve the problem.

17) April shoots an arrow upward into the air at a speed of 64 feet per second from a platform that is 21 feet high. The height of the arrow is given by the function $h(t) = -16t^2 + 64t + 21$, where t is the time is seconds. What is the maximum height of the arrow?

Write the equation of a polynomial function with the given characteristics. Use a leading coefficient of 1 or -1 and make the degree of the function as small as possible.

18) Touches the x-axis at 0 and crosses the x-axis at 3; lies below the x-axis between 0 and 3.

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

19) $x^2 + y^2 + 4x + 10y = 7$