Practice Exam 3 - 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.

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

1) $f(x) = x^4 + 3x^3 - 6x^2 + 5x - 12$ 1) _____

A) $\pm\frac{1}{12}, \pm 1, \pm 12$

B) $\pm\frac{1}{2}, \pm\frac{1}{3}, \pm\frac{1}{4}, \pm\frac{1}{6}, \pm\frac{1}{12}, \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$

C) $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$

D) $\pm 1, \pm\frac{1}{2}, \pm\frac{1}{3}, \pm\frac{1}{4}, \pm\frac{1}{6}, \pm\frac{1}{12}$

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

2) degree n = 3; - 5 and i are zeros; f(-3) = 60 2) _____

A) $f(x) = 3x^3 + 15x^2 - 3x - 15$

B) $f(x) = -3x^3 - 15x^2 - 3x - 15$

C) $f(x) = -3x^3 - 15x^2 + 3x + 15$

D) $f(x) = 3x^3 + 15x^2 + 3x + 15$

Find the domain of the rational function.

3) $f(x) = \frac{x + 8}{x^2 - 4x}$ 3) _____

A) $\{x | x \neq -2, x \neq 2, x \neq -8\}$

B) $\{x | x \neq 0, x \neq 4\}$

C) all real numbers

D) $\{x | x \neq -2, x \neq 2\}$

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

4) $\frac{x - 9}{x^2 - 10x + 24}$ 4) _____

A) x = - 9

B) x = -6, x = -4

C) x = 6, x = 4

D) x = 6, x = 4, x = - 9

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

5) $g(x) = \frac{8x^2 - 2x - 3}{9x^2 - 5x + 3}$ 5) _____

A) y = 0

B) $y = \frac{8}{9}$

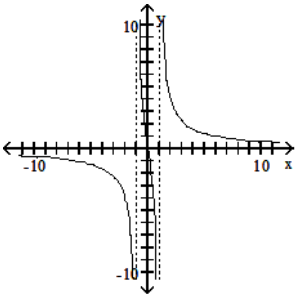
C) $y = \frac{2}{5}$

D) no horizontal asymptote

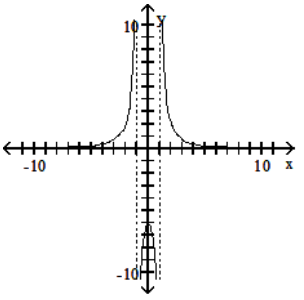
Match the equation with the appropriate graph.

6) $f(x) = \dfrac{6x}{x^2 - 1}$ 6) _____

A)



B)



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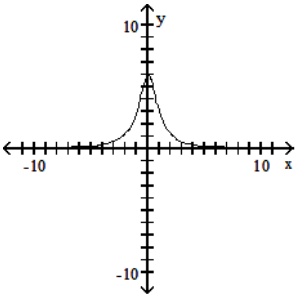
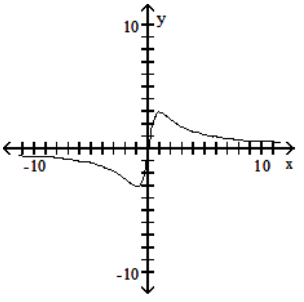


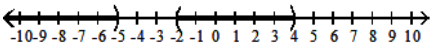
D)



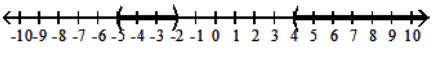
Solve the polynomial inequality and graph the solution set on a number line. Express the solution set in interval notation.

7) $(x + 5)(x + 2)(x - 4) > 0$ 7) _____

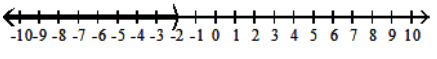
A) $(-\infty, -5) \cup (-2, 4)$



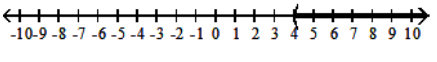
B) $(-5, -2) \cup (4, \infty)$



C) $(-\infty, -2)$



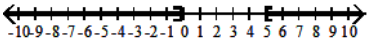
D) $(4, \infty)$



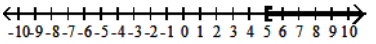
Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

8) $\frac{15 - 3x}{6x + 1} \leq 0$ 8) _____

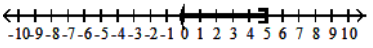
A) $\left(-\infty, -\frac{1}{6}\right]$ or $[5, \infty)$



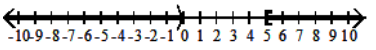
B) $[5, \infty)$



C) $\left(-\frac{1}{6}, 5\right]$



D) $\left(-\infty, -\frac{1}{6}\right]$ or $[5, \infty)$



Solve the problem.

9) The function $D(h) = 6e^{-0.4h}$ can be used to determine the milligrams D of a certain drug in a patient's bloodstream h hours after the drug has been given. How many milligrams (to two decimals) will be present after 9 hours? 9) _____

A) 219.59 mg B) 0.82 mg C) 0.16 mg D) 4.02 mg

Write the equation in its equivalent logarithmic form.

10) $5^3 = x$ 10) _____

A) $\log_x 5 = 3$ B) $\log_5 x = 3$ C) $\log_3 x = 5$ D) $\log_5 3 = x$

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

Write the equation in its equivalent exponential form.

11) $\log_b 64 = 3$ 11) _____

State the domain of the rational function.

12) $f(x) = \frac{(x - 9)(x + 1)}{x^2 - 1}$ 12) _____

Find the domain of the logarithmic function.

13) $f(x) = \ln (2 - x)$ 13) _____

Solve the problem.

14) The function $f(x) = 1 + 1.5 \ln (x + 1)$ models the average number of free-throws a basketball player can make consecutively during practice as a function of time, where x is the number of consecutive days the basketball player has practiced for two hours. After 206 days of practice, what is the average number of consecutive free throws the basketball player makes? 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.

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

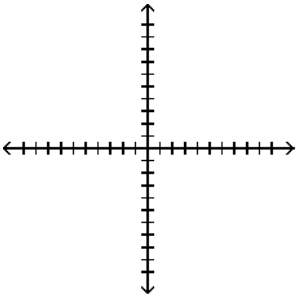
15) $f(x) = x^3 - 2x^2 - 11x + 52;\ -4$

Solve the polynomial inequality.

16) $x^3 + 4x^2 - 4x - 16 \geq 0$

Find all horizontal and vertical asymptotes . Find the x- and y-intercepts. Sketch a graph of the rational function.

17) $f(x) = \dfrac{x - 1}{x^2 - 4x - 5}$

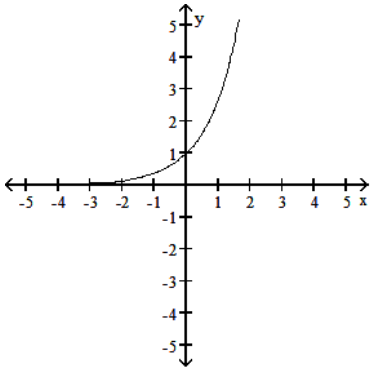


Find the domain of the function.

18) $f(x) = \log_{10}\left(\frac{x + 6}{x - 4}\right)$

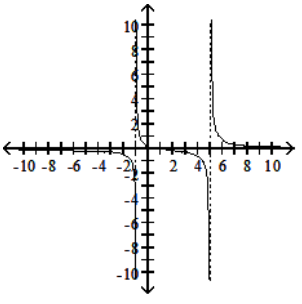
Provide an appropriate response.

19) $f(x) = a^x$

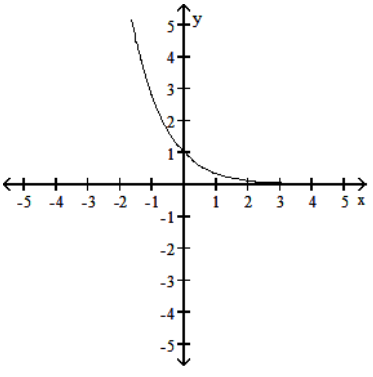


The graph of an exponential function with base a is given. Sketch the graph of $h(x) = a^{-x}$. Give the domain and r
of h.

1) C
2) D
3) B
4) C
5) B
6) A
7) B
8) D
9) C
10) B
11) $b^3 = 64$
12) $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$
13) $(-\infty, 2)$
14) 9 consecutive free throws
15) 3 + 2i, 3 - 2i
16) $[-4, -2] \cup [2, \infty)$
17) x-intercept: (1, 0) , y-intercept: $\left(0, \frac{1}{5}\right)$;



18) $(-\infty, -6) \cup (4, \infty)$
19)



domain: $(-\infty, \infty)$, range: $(0, \infty)$