



For the polynomial function find the following: (i) Degree of the polynomial; (ii) All x intercepts; (iii) The y intercept.

8)  $y = 4x + 1$

- A) (i) 1  
(ii) -4  
(iii) 4

- B) (i) 1  
(ii)  $\frac{1}{4}$   
(iii) 1

- C) (i) 1  
(ii)  $-\frac{1}{4}$   
(iii) 1

- D) (i) 1  
(ii) 1  
(iii)  $\frac{1}{4}$

8) \_\_\_\_\_

9)  $y = (x + 4)(x + 8)(x + 3)$

- A) (i) 3  
(ii) 4, 8, 3  
(iii) 96

- B) (i) 3  
(ii) -4, -8, -3  
(iii) -24

- C) (i) 3  
(ii) 4, 8, 3  
(iii) 24

- D) (i) 3  
(ii) -4, -8, -3  
(iii) 96

9) \_\_\_\_\_

10)  $f(x) = (x^6 + 7)(x^{10} + 9)$

- A) (i) 16  
(ii) 7, 9  
(iii) 63

- B) (i) 16  
(ii) none  
(iii) 63

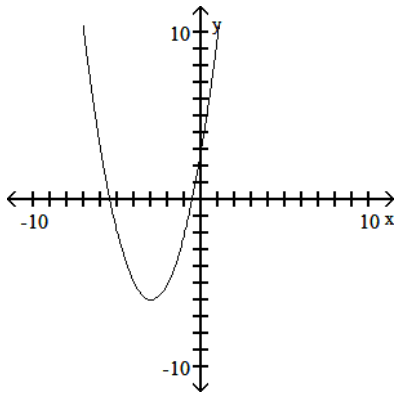
- C) (i) 60  
(ii) 7, 9  
(iii) -63

- D) (i) 60  
(ii) none  
(iii) -63

10) \_\_\_\_\_

The graph that follows is the graph of a polynomial function. (i) What is the minimum degree of a polynomial function that could have the graph? (ii) Is the leading coefficient of the polynomial negative or positive?

11)



- A) (i) 2  
(ii) Positive

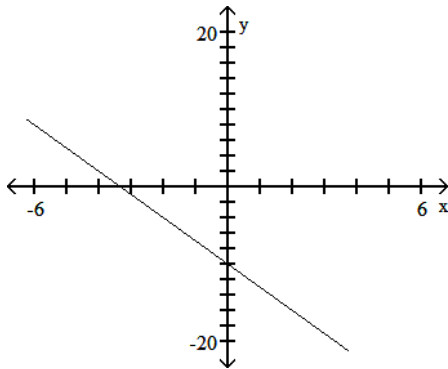
- B) (i) 2  
(ii) Negative

- C) (i) 3  
(ii) Negative

- D) (i) 3  
(ii) Positive

11) \_\_\_\_\_

12)



- A) (i) 2  
(ii) Negative

- B) (i) 1  
(ii) Positive

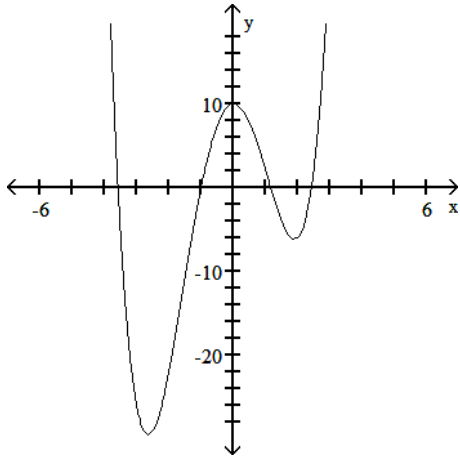
- C) (i) 1  
(ii) Negative

- D) (i) 2  
(ii) Positive

12) \_\_\_\_\_

13)

13) \_\_\_\_\_



A) (i) 3  
(ii) Negative

B) (i) 4  
(ii) Negative

C) (i) 3  
(ii) Positive

D) (i) 4  
(ii) Positive

For the rational function below (i) Find the intercepts for the graph; (ii) Determine the domain; (iii) Find any vertical or horizontal asymptotes for the graph; (iv) Sketch any asymptotes as dashed lines. Then sketch the graph of  $y = f(x)$ .

14)  $f(x) = \frac{x+2}{x+1}$

For the rational function below (i) Find any intercepts for the graph; (ii) Find any vertical and horizontal asymptotes for the graph; (iii) Sketch any asymptotes as dashed lines. Then sketch a graph of  $f$ .

15)  $y = \frac{6}{x^2 - 1}$

Graph the function.

16)  $f(x) = 5^x$

Solve the problem.

17) A sample of 800 grams of radioactive substance decays according to the function 17) \_\_\_\_\_

$A(t) = 800e^{-0.028t}$ , where  $t$  is the time in years. How much of the substance will be left in the sample after 10 years? Round to the nearest whole gram.

- A) 1 gram                      B) 605 grams                      C) 9 grams                      D) 800 grams

18) The number of reports of a certain virus has increased exponentially since 1960. The current 18) \_\_\_\_\_

number of cases can be approximated using the function  $r(t) = 207 e^{0.005t}$ , where  $t$  is the number of years since 1960. Estimate the of cases in the year 2010.

- A) 240                      B) 266                      C) 190                      D) 207

Write in terms of simpler forms.

19)  $\log_4 XY$  19) \_\_\_\_\_

- A)  $\log_4 X - \log_4 Y$                       B)  $\log_4 X + \log_4 Y$                       C)  $\log_2 X + \log_2 Y$                       D)  $\log_2 X - \log_2 Y$

20)  $\log_b M^9$

A)  $M + \log_b 9$

B)  $9 \log_b M$

C)  $9 + \log_b M$

D)  $M \log_b 9$

20) \_\_\_\_\_

Solve for x to two decimal places (using a calculator).

21)  $5.2 = 1.006^{12x}$

A) 1.07

B) 5.17

C) 2.32

D) 22.97

21) \_\_\_\_\_

Graph by converting to exponential form first.

22)  $y = \log_2 (x - 1)$

Solve the problem.

23) A country has a population growth rate of 2.4% compounded continuously. At this rate, how long will it take for the population of the country to double? Round your answer to the nearest tenth.

A) 30 years

B) 2.9 years

C) 28.9 years

D) .29 years

23) \_\_\_\_\_

24) Book sales on the Internet (in billions of dollars) in year x are approximated by  $f(x) = 1.84 + 2.1 \cdot \ln x$ , where x = 0 corresponds to 2000. How much will be spent on Internet book sales in 2008? Round to the nearest tenth.

A) 3.9 billion

B) 6.2 billion

C) 8.0 billion

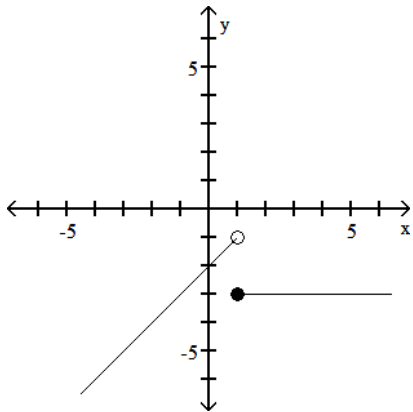
D) 6.0 billion

24) \_\_\_\_\_

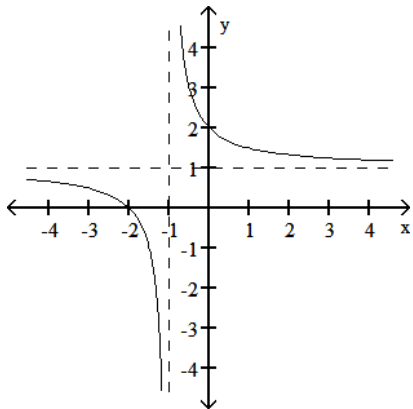
Answer Key

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- 1) D
- 2) B
- 3) C
- 4) A
- 5) B
- 6) C
- 7)



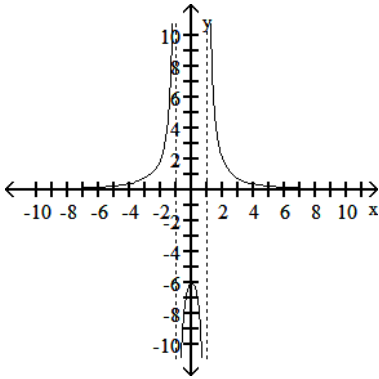
- 8) C
- 9) D
- 10) B
- 11) A
- 12) C
- 13) D
- 14) (i) x intercept: -2; y intercept: 2  
(ii) Domain: all real numbers except -1  
(iii) Vertical asymptote:  $x = -1$ ; horizontal asymptote:  $y = 1$   
(iv)



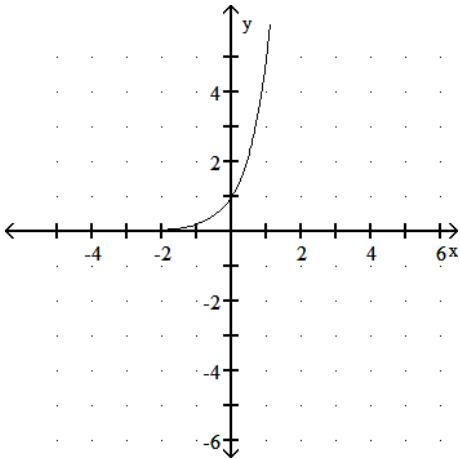
Answer Key

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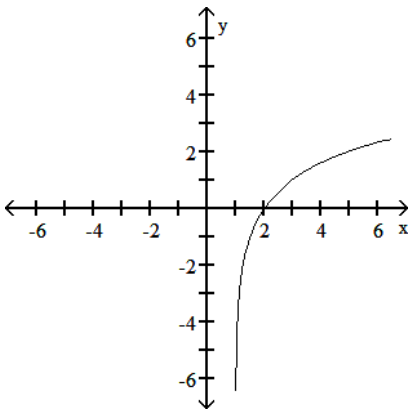
- 15) (i) y intercept: - 6  
(ii) horizontal asymptote:  $y = 0$ ; vertical asymptotes:  $x = 1$  and  $x = -1$   
(iii)



16)



- 17) B  
18) B  
19) B  
20) B  
21) D  
22)



- 23) C  
24) B