

Find the slope of the line containing the two points.

1) (6, 1); (2, -4)

A) $-\frac{4}{5}$

B) $\frac{4}{5}$

C) $\frac{5}{4}$

D) $-\frac{5}{4}$

1) _____

Find an equation for the line, in the indicated form, with the given properties.

2) Containing the points (7, 0) and (0, -9); general form

A) $9x - 7y = 63$

B) $y = -\frac{9}{7}x + 7$

C) $y = -\frac{9}{7}x - 9$

D) $9x + 7y = 63$

2) _____

Perform the indicated operations and simplify the result. Leave the answer in factored form.

3) $\frac{x^2 - 18x + 81}{x^2 - 100} \cdot \frac{x^2 - 10x}{x - 9}$

A) $\frac{x}{x - 10}$

B) $\frac{x(x - 9)}{x - 10}$

C) $\frac{x(x - 9)}{x + 10}$

D) $\frac{(x - 9)}{x + 10}$

3) _____

For the polynomial, list each real zero and its multiplicity. Determine whether the graph crosses or touches the x-axis at each x-intercept.

4) $f(x) = \left(x + \frac{1}{2}\right)^4 (x + 3)^5$

A) $-\frac{1}{2}$, multiplicity 4, crosses x-axis; -3, multiplicity 5, touches x-axis

B) $\frac{1}{2}$, multiplicity 4, touches x-axis; 3, multiplicity 5, crosses x-axis

C) $-\frac{1}{2}$, multiplicity 4, touches x-axis; -3, multiplicity 5, crosses x-axis

D) $\frac{1}{2}$, multiplicity 4, crosses x-axis; 3, multiplicity 5, touches x-axis

4) _____

Find the center (h, k) and radius r of the circle with the given equation.

5) $(x + 10)^2 + (y + 4)^2 = 64$

A) (h, k) = (-4, -10); r = 64

B) (h, k) = (-10, -4); r = 64

C) (h, k) = (-4, -10); r = 8

D) (h, k) = (-10, -4); r = 8

5) _____

Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, assume that the base is not 0.

6) $\left(\frac{-8x^5y^{-5}}{5z^5}\right)^{-2}$

A) $\frac{25z^{10}}{64x^{10}y^{10}}$

B) $\frac{25y^{10}}{64x^{10}z^{10}}$

C) $\frac{25y^{10}z^{10}}{64x^{10}}$

D) $\frac{64x^{10}}{25y^{10}z^{10}}$

6) _____

Solve the equation.

$$7) \frac{4}{x+4} - \frac{9}{x-4} = \frac{13}{(x+4)(x-4)}$$

A) {13}

B) {65}

C) {39}

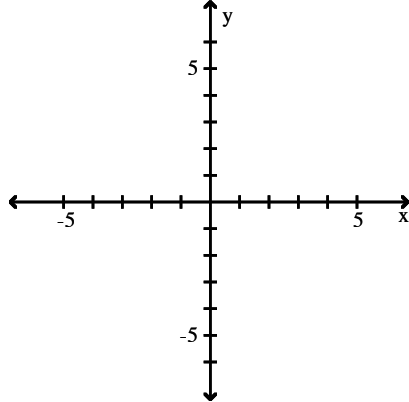
D) {-13}

7) _____

Graph the function.

8)

$$f(x) = \begin{cases} -x + 3 & \text{if } x < 2 \\ 2x - 3 & \text{if } x \geq 2 \end{cases}$$



8) _____

Find the domain of the function.

$$9) f(x) = x^2 + 6$$

A) all real numbers

C) $\{x \mid x \neq -6\}$

B) $\{x \mid x > -6\}$

D) $\{x \mid x \geq -6\}$

9) _____

$$10) h(x) = \frac{x-4}{x^3-36x}$$

A) all real numbers

C) $\{x \mid x \neq 0\}$

B) $\{x \mid x \neq 4\}$

D) $\{x \mid x \neq -6, 0, 6\}$

10) _____

$$11) \frac{x}{\sqrt{x-6}}$$

A) $\{x \mid x > 6\}$

C) $\{x \mid x \neq 6\}$

B) all real numbers

D) $\{x \mid x \geq 6\}$

11) _____

Find the function.

12) Find the function that is finally graphed after the following transformations are applied to the graph of $y = |x|$. The graph is shifted right 3 units, stretched by a factor of 3, shifted vertically down 2 units, and finally reflected across the x-axis.

A) $y = -3|x-3| - 2$

C) $y = -(3|x+3| - 2)$

B) $y = 3|-x-3| - 2$

D) $y = -(3|x-3| - 2)$

12) _____

Determine whether the graph of the equation is symmetric with respect to the x-axis, the y-axis, and/or the origin.

13) $y^2 - x - 64 = 0$

13) _____

- A) y-axis
- B) origin
- C) x-axis
- D) x-axis, y-axis, origin
- E) none

List the potential rational zeros of the polynomial function. Do not find the zeros.

14) $f(x) = 7x^4 - x^2 + 2$

14) _____

- A) $\pm \frac{1}{7}, \pm \frac{2}{7}, \pm 1, \pm 2, \pm 7$
- B) $\pm \frac{1}{7}, \pm \frac{1}{2}, \pm 1, \pm 2, \pm 7$
- C) $\pm \frac{1}{7}, \pm \frac{2}{7}, \pm 1, \pm 2$
- D) $\pm \frac{1}{2}, \pm \frac{7}{2}, \pm 1, \pm 7$

Find the real zeros, if any, of each quadratic function using the quadratic formula. List the x-intercepts, if any, of the graph of the function.

15) $F(x) = 5x^2 - 7x - 1$

15) _____

- A) $x = \frac{7 + \sqrt{69}}{10}$
- B) $x = \frac{-7 \pm \sqrt{69}}{10}$
- C) $x = \frac{7 \pm \sqrt{69}}{10}$
- D) No real zeros or x-intercepts

Solve the equation using substitution.

16) $(2x - 6)^2 - 4(2x - 6) + 3 = 0$

16) _____

- A) $x = \frac{9}{2}, x = \frac{7}{2}$
- B) $x = \frac{3}{2}, x = -\frac{5}{2}$
- C) $x = -\frac{3}{6}, x = \frac{5}{2}$
- D) $x = -\frac{9}{2}, x = -\frac{7}{2}$

Use a graphing calculator to plot the data and find the quadratic function of best fit.

17) The following table shows the median number of hours of leisure time that Americans had each week in various years.

17) _____

Year	1973	1980	1987	1993	1997
Median # of Leisure hrs per Week	26.2	19.2	16.6	18.8	19.5

Use $x = 0$ to represent the year 1973. Using a graphing utility, determine the quadratic regression equation for the data given. What year corresponds to the time when Americans had the least time to spend on leisure?

Solve the problem.

18) The profits (in millions) for a company for 8 years was as follows:

18) _____

Year, x	Profits
1993, 1	1.1
1994, 2	1.7
1995, 3	2.0
1996, 4	1.4
1997, 5	1.3
1998, 6	1.5
1999, 7	1.8
2000, 8	2.1

Find the cubic function of best fit to the data.

Solve the inequality.

19) $x^4 - 81x^2 < 0$

19) _____

- A) $(-\infty, -9)$ or $(0, 9)$
- C) $(-9, 0)$ or $(0, 9)$

- B) $(-9, 0)$ or $(9, \infty)$
- D) $(-\infty, -9)$ or $(9, \infty)$

20) $\frac{(x-1)(3-x)}{(x-2)^2} \leq 0$

20) _____

- A) $(-\infty, 1]$ or $[3, \infty)$
- C) $(-\infty, 1)$ or $(3, \infty)$

- B) $(-\infty, -3]$ or $(-2, -1)$ or $[1, \infty)$
- D) $(-\infty, -3)$ or $(-1, \infty)$

Find the oblique asymptote of the given function.

21) $f(x) = \frac{x^2 + 9x - 5}{x - 7}$

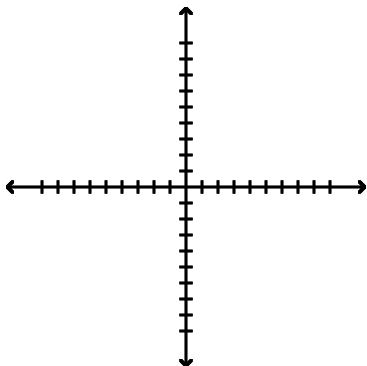
21) _____

- A) $y = x + 16$
- B) $x = y + 16$
- C) None
- D) $y = x + 2$

Graph the rational function.

22) $f(x) = \frac{5x + 1}{x - 2}$

22) _____



Rewrite in log notation.

23) $x\sqrt{5} = \pi$

A) $\sqrt{5} = \log_{\pi} x$

B) $x = \log_{\pi} \sqrt{5}$

C) $\sqrt{5} = \log_x \pi$

D) $x = \log_{\sqrt{5}} \pi$

23) _____

Rewrite in exponential notation.

24) $\log_{\pi} 37 = x$

A) $37^x = \pi$

B) $\pi^x = 37$

C) $\pi^x = \frac{1}{37}$

D) $x\pi = 37$

24) _____

Write as the sum and/or difference of logarithms. Express powers as factors.

25) $\log_5 \frac{\sqrt[7]{x} \sqrt[2]{y}}{z^2}$

A) $\frac{7}{5} \log_5 x + \frac{2}{5} \log_5 y - \frac{2}{5} \log_5 z$

B) $\frac{1}{7} \log_5 x + \frac{1}{2} \log_5 y - 2 \log_5 z$

C) $7 \log_5 x + 2 \log_5 y - 2 \log_5 z$

D) $\frac{1}{7} \log_5 x \cdot \frac{1}{2} \log_5 y \div 2 \log_5 z$

25) _____

Express as a single logarithm.

26) $5 \log_a t - \frac{6}{5} \log_a s + \frac{1}{4} \log_a v - 3 \log_a u$

A) $\log_a \frac{t^5 u^3}{v^{1/4} s^{6/5}}$

B) $\log_a \frac{t^5 s^{6/5}}{v^{1/4} u^3}$

C) $\log_a \frac{t^5 v^{1/4}}{s^{6/5} u^3}$

D) $\log_a \left(5t - \frac{6}{5}s + \frac{1}{4}v - 3u \right)$

26) _____

Solve the following equations.

27) $\log(4x) = \log 5 + \log(x-3)$

A) $\{-15\}$

B) $\left\{ \frac{2}{3} \right\}$

C) $\left\{ -\frac{5}{3} \right\}$

D) $\{15\}$

27) _____

28) $\log_3(x-5) + \log_3(x-11) = 3$

A) $\{2\}$

B) $\{14, 2\}$

C) $\{15\}$

D) $\{14\}$

28) _____

$$29) 2(5 - 3x) = \frac{1}{16}$$

29) _____

A) {8}

B) {-3}

C) $\left\{\frac{1}{8}\right\}$

D) {3}

$$30) 9^{7x+3} = 27$$

30) _____

$$31) 3^{2x} + 3^x - 6 = 0$$

31) _____

Solve the system of non-linear equations .

32)

$$\begin{cases} y = x^2 - 4x + 4 \\ x + y = 32 \end{cases}$$

32) _____

A) $x = 7, y = 39; x = -4, y = 36$

B) $x = -7, y = 39; x = 4, y = 28$

C) $x = 2, y = 30$

D) $x = 7, y = 25; x = -4, y = 36$

Write out the first five terms of the sequence.

$$33) \left\{ \frac{n}{n^2 + 2} \right\}$$

33) _____

A) $\frac{1}{2}, \frac{1}{3}, \frac{3}{8}, \frac{2}{5}, \frac{5}{12}$

B) $\frac{1}{4}, \frac{1}{3}, \frac{3}{8}, \frac{2}{5}, \frac{5}{12}$

C) $\frac{1}{3}, \frac{1}{3}, \frac{3}{11}, \frac{2}{9}, \frac{5}{27}$

D) $\frac{1}{3}, \frac{1}{3}, \frac{3}{8}, \frac{2}{5}, \frac{5}{12}$

The sequence is defined recursively. Write the first four terms.

$$34) a_1 = 5 \text{ and } a_n = 3a_{n-1} + 5 \text{ for } n \geq 2$$

34) _____

A) 5, 15, 45, 135

B) 5, 20, 65, 200

C) 5, 20, 50, 140

D) 5, 10, 25, 70

Express the sum using summation notation.

$$35) 2 + 4 + 6 + \dots + 12$$

35) _____

A)

$$\sum_{k=0}^6 2k$$

B)

$$\sum_{k=1}^6 2k^2$$

C)

$$\sum_{k=1}^6 2k$$

D)

$$\sum_{k=1}^6 k^2$$

Find the sum of the sequence.

36)

$$\sum_{k=3}^5 (k^2 + 7)$$

36) _____

k = 3

A) 90

B) 45

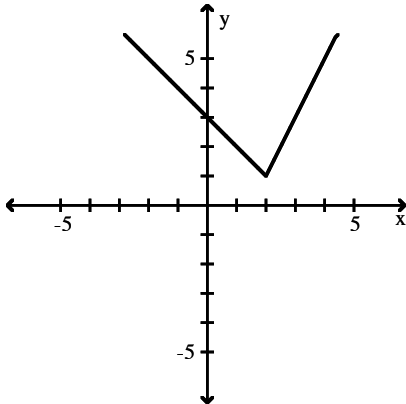
C) 71

D) 33

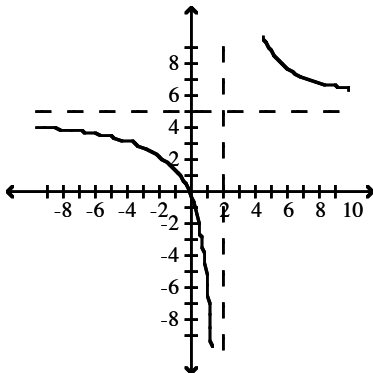
Answer Key

Testname: 150_FINAL_EX_REV.SP.2010

- 1) C
- 2) A
- 3) C
- 4) C
- 5) D
- 6) C
- 7) D
- 8)



- 9) A
- 10) D
- 11) A
- 12) D
- 13) C
- 14) C
- 15) C
- 16) A
- 17) $M(x) = 0.04x^2 - 1.21x + 26.03; 1988$
- 18) $y = 0.03x^3 - 0.34x^2 + 1.31x + 0.17$
- 19) C
- 20) A
- 21) A
- 22)



- 23) C
- 24) B
- 25) B
- 26) C

Answer Key

Testname: 150_FINAL_EX_REV.SP.2010

27) D

28) D

29) D

$$30) \left\{ -\frac{3}{14} \right\}$$

$$31) \left\{ \frac{\ln 2}{\ln 3} \right\}$$

32) D

33) C

34) B

35) C

36) C