

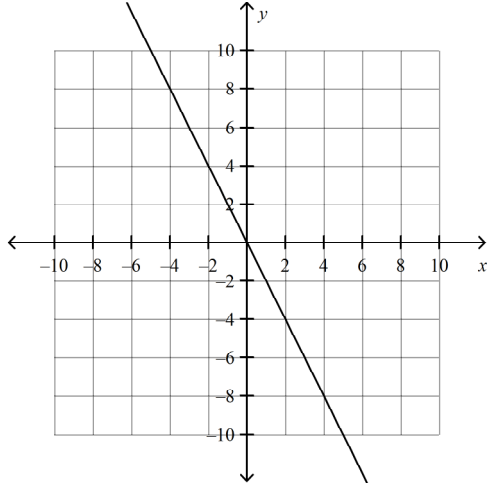
Algebra II Practice Test 8

Multiple Choice

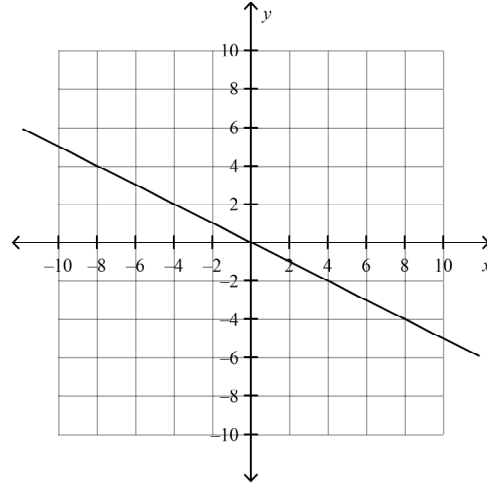
Identify the choice that best completes the statement or answers the question.

- _____ 1. (1 point) Given: y varies directly as x , and $y = -5$ when $x = 2.5$. Write and graph the direct variation function.

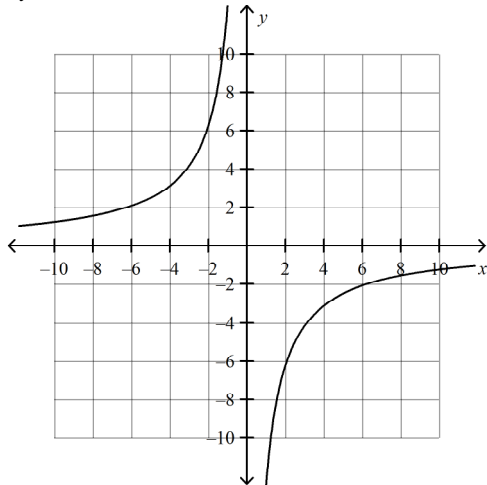
A) $y = -2x$



C) $y = -0.5x$



B) $xy = -12.5$



- D) Not enough information. It takes two points to determine a line.

- _____ 2. (1 point) Distance varies directly as time because as time increases, the distance traveled increases proportionally. The speed of sound in air is about 335 feet per second. How long would it take for sound to travel 11,725 feet?

A) 35 sec

C) 30 sec

B) 45 sec

D) 40 sec

- _____ 3. (1 point) The volume V of a cylinder varies jointly with the height h and the radius squared r^2 , and $V = 157.00$ cm^3 when $h = 2$ cm and $r^2 = 25$ cm^2 . Find V when $h = 3$ cm and $r^2 = 36$ cm^2 . Round your answer to the nearest hundredth.

A) 339.12 cm^3

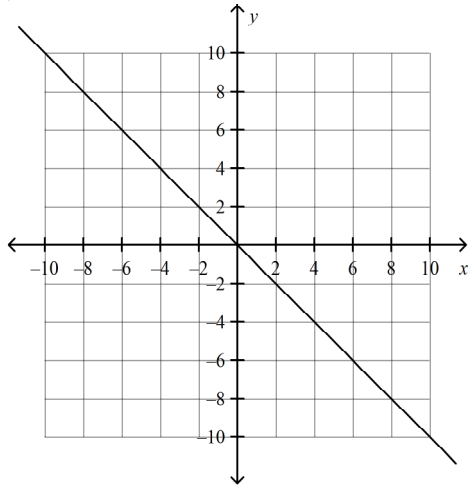
C) 3.14 cm^3

B) 157.00 cm^3

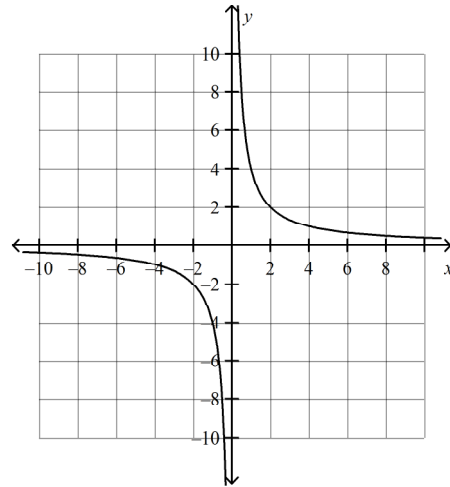
D) 39.00 cm^3

_____ 4. (1 point) Given: y varies inversely as x , and $y = 4$ when $x = -4$. Write and graph the inverse variation function.

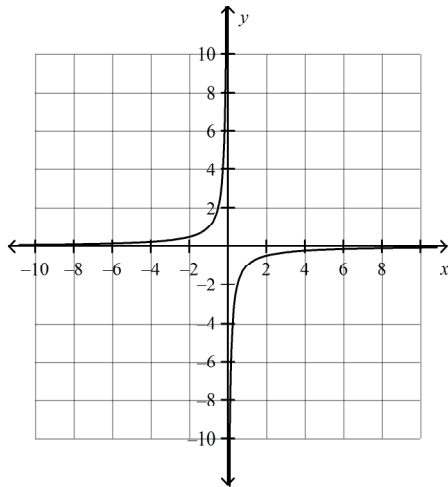
A) $y = -x$



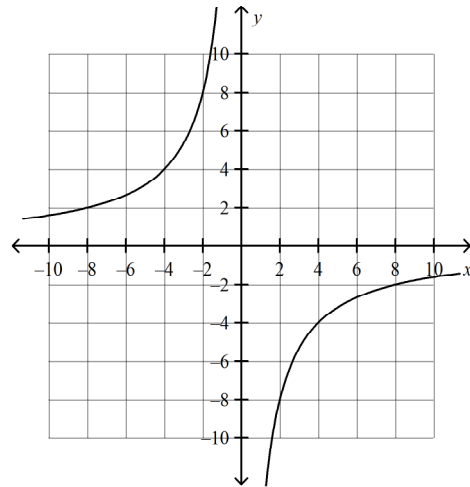
C) $y = \frac{4}{x}$



B) $y = -\frac{1}{x}$



D) $y = -\frac{16}{x}$



_____ 5. (1 point) The number of lawns l that a volunteer can mow in a day varies inversely with the number of shrubs s that need to be pruned that day. If the volunteer can prune 6 shrubs and mow 8 lawns in one day, then how many lawns can be mowed if there are only 3 shrubs to be pruned?

A) 4 lawns

C) 11 lawns

B) 5 lawns

D) 16 lawns

_____ 6. (1 point) Determine whether the data set represents a direct variation, an inverse variation, or neither.

x	y
2	420
3	280
4	210

A) Direct variation

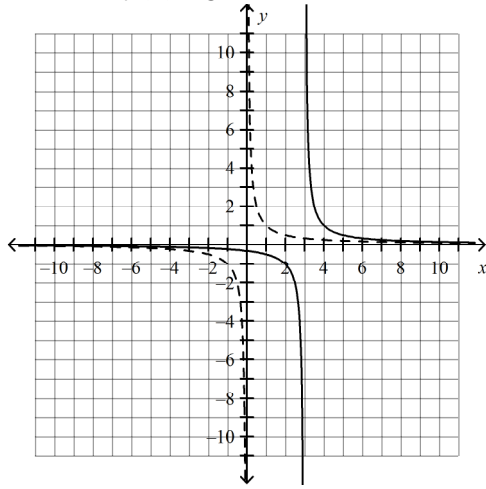
C) Inverse variation

B) Neither

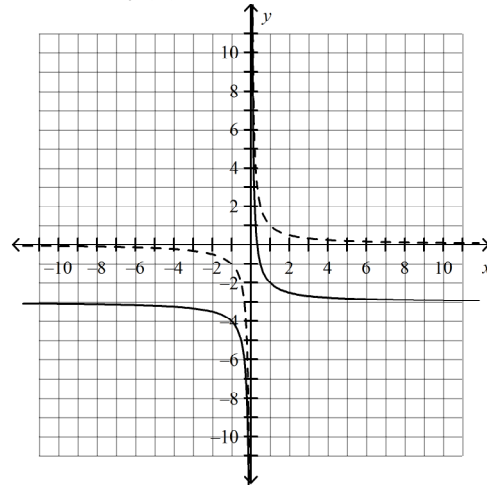
- _____ 12. (1 point) Solve $\frac{x^2 + x - 30}{x - 5} = 11$. Check your answer.
- A) $x = 5$
B) $x = 16$
C) $x = -6$
D) There is no solution because the original equation is undefined at $x = 5$.
- _____ 13. (1 point) The area of a rectangle is equal to $x^2 + 10x + 16$ square units. If the length of the rectangle is equal to $x + 8$ units, what expression represents its width?
- A) $x - 2$
B) $x + 2$
C) $x + 4.00$
D) $x + 8$
- _____ 14. (1 point) Find the least common multiple for $6(x + 1)^3(x - 4)^2$ and $10(x + 1)^8(x - 4)^5$.
- A) $10(x + 1)^3(x - 4)^2$
B) $30(x + 1)^8(x - 4)^5$
C) $2(x + 1)^8(x - 4)^5$
D) $30(x + 1)^3(x - 4)^2$
- _____ 15. (1 point) Add $\frac{x + 6}{x - 7} + \frac{-12x - 59}{x^2 - 3x - 28}$.
- A) $\frac{-11x - 53}{x^2 - 2x - 35}$
B) $\frac{x^2 + 10x + 24}{(x + 4)(x - 7)}$
C) $\frac{x + 6}{(x - 7)(x + 4)}$
D) $\frac{x + 5}{x + 4}$
- _____ 16. (1 point) Subtract $\frac{2x^2 - 48}{x^2 - 16} - \frac{x + 6}{x + 4}$. Identify any x -values for which the expression is undefined.
- A) $\frac{x - 6}{x - 4}$
The expression is undefined at $x = 4$ and $x = -4$.
- B) $\frac{x^2 + 2x - 72}{(x - 4)(x + 4)}$
The expression is undefined at $x = 4$ and $x = -4$.
- C) $\frac{x + 6}{x - 4}$
The expression is undefined at $x = 4$ and $x = -4$.
- D) $\frac{x - 6}{x + 4}$
The expression is undefined at $x = 4$ and $x = -4$.

_____ 17. (1 point) Using the graph of $f(x) = \frac{1}{x}$ as a guide, describe the transformation and graph $g(x) = \frac{1}{x} + 3$.

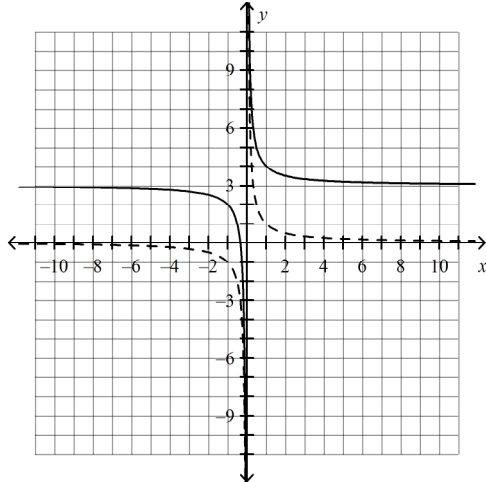
A) Translate $f(x)$ right 3 units.



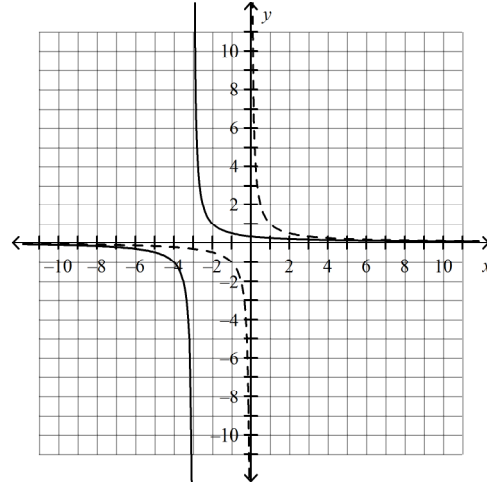
C) Translate $f(x)$ down 3 units.



B) Translate $f(x)$ up 3 units.



D) Translate $f(x)$ left 3 units.



_____ 18. (1 point) Identify the asymptotes, domain, and range of the function $g(x) = \frac{1}{x+7} + 3$.

A) Vertical asymptote: $x = -7$

Domain: $\{x|x \neq -7\}$

Horizontal asymptote: $y = -3$

Range: $\{y|y \neq -3\}$

B) Vertical asymptote: $x = 7$

Domain: $\{x|x \neq 7\}$

Horizontal asymptote: $y = 3$

Range: $\{y|y \neq 3\}$

C) Vertical asymptote: $x = 7$

Domain: $\{x|x \neq 7\}$

Horizontal asymptote: $y = -3$

Range: $\{y|y \neq -3\}$

D) Vertical asymptote: $x = -7$

Domain: $\{x|x \neq -7\}$

Horizontal asymptote: $y = 3$

Range: $\{y|y \neq 3\}$

- _____ 19. (1 point) Zelon Pharmaceuticals maintains a courier plane to transport company executives back and forth between the company headquarters and the main manufacturing plant 250 miles away. Today the pilot flew from headquarters to the plant, picked up the Chief of Operations, and returned to headquarters. On the first leg of the trip, the pilot flew against a headwind averaging 10 miles per hour. On the return leg, the average tailwind was 30 miles per hour. If the pilot spent a total of four hours in the air, what would the average speed of the courier plane be with no wind? Round your answer to the nearest mile per hour.
- A) 118 mph
B) 121 mph
C) 125 mph
D) Cannot determine. To determine the average speed, you need the time it took for each leg of the trip, not the total time.
- _____ 20. (1 point) Jeremy and Ahmed are painting a wall. Working alone, Jeremy can paint $\frac{1}{4}$ of the wall in 1 hour. Working together, Jeremy and Ahmed can paint the entire wall in 35 minutes. How long would it take Ahmed to paint the entire the wall by himself?
- A) 20 minutes
B) 35 minutes
C) 3 hours
D) 4 hours
- _____ 21. (1 point) Solve $\frac{x}{x-6} \geq -1$ by using a graph and a table.
- A) $x \leq 3$ or $x \geq 6$
B) $x \leq 3$ or $x > 6$
C) $3 \leq x \leq 6$
D) $3 \leq x < 6$
- _____ 22. (1 point) Solve the inequality $\frac{5}{x+3} < 6$ algebraically.
- A) $x < -3$ or $x > -\frac{13}{6}$
B) $-\frac{13}{6} < x < -3$
C) $x < -\frac{13}{6}$ or $x > -3$
D) $-3 < x < -\frac{13}{6}$
- _____ 23. (1 point) Simplify the expression $(27)^{\frac{1}{3}} \cdot (27)^{\frac{2}{3}}$.
- A) 9
B) 3
C) 27
D) 729
- _____ 24. (1 point) Solve the equation $-6 + \sqrt{x-5} = -2$.
- A) $x = 11$
B) $x = 9$
C) $x = 21$
D) $x = 16$
- _____ 25. (1 point) The speed s in miles per hour that a car is traveling when it goes into a skid can be estimated by the formula $s = \sqrt{30fd}$, where f is the coefficient of friction and d is the length of the skid marks in feet. On the highway near Lake Tahoe, a police officer finds a car on the shoulder, abandoned by a driver after a skid and crash. He is sure that the driver was driving faster than the speed limit of 20 mi/h because the skid marks measure 9 feet and the coefficient of friction under those conditions would be 0.7. At about what speed was the driver driving at the time of the skid? Round your answer to the nearest mi/h.
- A) 23 mi/h
B) 189 mi/h
C) 14 mi/h
D) 19 mi/h

_____ 26. (5 points) Find all the real fourth roots of 16.

- A) -2 C) 2 and -2
B) no real roots D) 2

_____ 27. (5 points) Solve the equation $\frac{2x}{x^2 - 7x - 18} = \frac{6x}{x^2 + x - 2}$.

- A) $x = 0$ or $x = -13$ C) $x = 9$ or $x = 1$
B) $x = -2$, $x = 9$, or $x = 1$ D) $x = 0$ or $x = 13$

_____ 28. (5 points) Simplify $\frac{\frac{-5}{x-4} + \frac{x-6}{10}}{\frac{x+3}{x-4}}$. Assume that all expressions are defined.

- A) $\frac{x-56}{10(x+3)}$ C) $\frac{x^2 - 10x - 26}{10(x+3)}$
B) $\frac{x^2 - 10x - 26}{10(x^2 - x - 12)}$ D) $\frac{x^3 - 14x^2 + 14x + 104}{10(x^2 - x - 12)}$

_____ 29. (5 points) Identify the zeros and vertical asymptotes of $g(x) = \frac{x^2 - 4x + 3}{x + 2}$.

- A) Zeros at 1 and 3.
Vertical asymptote: $x = -2$ C) Zeros at -1 and -3 .
Vertical asymptote: $x = 2$
B) Zeros at -1 and -3 .
Vertical asymptote: $x = 2$ D) Zeros at 1 and 3.
Vertical asymptote: $x = -2$

_____ 30. (5 points) Solve $\sqrt{x+31} = x+1$.

- A) $x = -6$ C) No solution.
 $\sqrt{x+31}$ is not defined for $x < -31$.
B) $x = 5$ or $x = -6$ D) $x = 5$

_____ 31. (5 points) Michaela climbed up a mountain at an average speed of 3 mi/h. She climbed down at an average speed of 5 mi/h. What is Michaela's average speed for the entire trip? Round to the nearest tenth.

- A) 3.8 mi/h C) 1.9 mi/h
B) 4.0 mi/h D) 3.9 mi/h

_____ 32. (5 points) Solve $\sqrt{11x} = 3\sqrt{x+2}$.

- A) $x = 9$ C) $x = 18$
B) $x = 11$ D) $x = 14$

- _____ 33. (5 points) Write the expression $\sqrt[11]{10^8}$ by using rational exponents.
- A) $10^{\frac{8}{11}}$ C) 10^{-3}
 B) 10^3 D) $10^{\frac{11}{8}}$
- _____ 34. (5 points) Write the expression $8^{\frac{5}{3}}$ in radical form, and simplify. Round to the nearest whole number if necessary.
- A) $(\sqrt[5]{8})^3; 3$ C) $(\sqrt[3]{8})^5; 32$
 B) $\sqrt[5]{8}; 32$ D) $\frac{8^5}{8^3}; 64$
- _____ 35. (5 points) Subtract $\frac{-6x^2 + x - 3}{x^2 + 9} - \frac{-2x - 4}{x^2 + 9}$. Identify any x -values for which the expression is undefined.
- A) $\frac{-6x^2 - x - 7}{x^2 + 9}$; The expression is always defined.
 B) $\frac{-6x^2 - x - 7}{x^2 + 9}$; The expression is undefined at $x = \pm 3$.
 C) $\frac{-6x^2 + 3x + 1}{x^2 + 9}$; The expression is undefined at $x = \pm 3$.
 D) $\frac{-6x^2 + 3x + 1}{x^2 + 9}$; The expression is always defined.
- _____ 36. (5 points) Identify the zeros and asymptotes of $f(x) = \frac{2x^2 - 18}{x^2 - 16}$.
- A) Zeros: -4 and 4
 Vertical asymptotes: $x = -3, x = 3$
 Horizontal asymptote: $y = 2$
 C) Zeros: -3 and 3
 Vertical asymptotes: $x = -4, x = 4$
 Horizontal asymptote: $y = 2$
 B) Zeros: -3 and 3
 Vertical asymptotes: $x = -4, x = 4$
 Horizontal asymptote: $y = 1$
 D) Zeros: -4 and 4
 Vertical asymptotes: $x = -3, x = 3$
 Horizontal asymptote: $y = 1$
- _____ 37. (5 points) Simplify the expression $\sqrt[4]{256z^{16}}$. Assume that all variables are positive.
- A) $\sqrt[4]{256z^4}$ C) $\sqrt[4]{256z^{11}}$
 B) $4z^4$ D) $4z^{11}$

- _____ 38. (5 points) Frets are small metal bars positioned across the neck of a guitar so that the guitar can produce notes of a specific scale. To find the distance a fret should be placed from the bridge, multiply the string length by $2^{\frac{-n}{12}}$ where n is the number of notes higher than the string's root note.

Determine where to place a fret to produce an A note on a C string (5 notes higher) that is 70 cm long. Round your answer to the nearest hundredth.

- A) 52.44 cm C) 74.92 cm
B) 58.33 cm D) 93.44 cm

- _____ 39. (5 points) Solve the equation $\frac{6x}{x-3} = \frac{4x+6}{x-3}$.
- A) There is no solution. C) $x = 3$
B) $x = -\frac{3}{2}$ D) $x = -3$

- _____ 40. (5 points) Identify holes in the graph of $f(x) = \frac{x^2 + 8x + 12}{x + 2}$.
- A) There is a hole in the graph at $x = -6$.
- B) There is a hole in the graph at $x = -2$.
- C) There are no holes in the graph.
- D) There is a hole in the graph at $x = 2$.

- _____ 41.** (5 points) Solve the equation $x - 9 = -\frac{18}{x}$.
- A) $x = 6$
- B) $x = 3$ or $x = 6$
- C) $x = -3$ or $x = -6$
- D) $x = 3$

- _____ 42. (5 points) Solve $(-3x + 18)^{\frac{1}{2}} = x$.
- A) $x = -6$ or $x = 3$
- B) $x = -6$
- C) $x = 6$ or $x = -3$
- D) $x = 3$

43. (5 points) The cost per student of a camping trip varies inversely as the number of students who attend. It will cost each student \$85 if 28 students attend. How many students would have to attend to get the cost down to \$74.38?

Name: _____

ID: A

44. (1 point) A camping group hikes the same distance on each day of a four-day hiking trip. The table shows the group's average speed on each day. What is the group's average speed for the entire trip, rounded to the nearest tenth of a kilometer per hour?

Hiking Results	
Day	Speed (km/h)
1	6.2
2	5.9
3	4.4
4	3.9

45. (1 point) How many vertical asymptotes does the graph of $f(x) = \frac{x^2 + 9}{x^2 - 4x + 4}$ have?
46. (1 point) What value of x makes $(2x + 17)^{\frac{1}{3}} = 3$ a true statement?

Algebra II Practice Test 8

Answer Section

MULTIPLE CHOICE

1.	ANS: A	PTS: 1	REF: Page 569
2.	ANS: A	PTS: 1	REF: Page 570
3.	ANS: A	PTS: 1	REF: Page 570
4.	ANS: D	PTS: 1	REF: Page 571
5.	ANS: D	PTS: 1	REF: Page 571
6.	ANS: C	PTS: 1	REF: Page 572
7.	ANS: A	PTS: 1	REF: Page 572
8.	ANS: A	PTS: 1	REF: Page 577
9.	ANS: B	PTS: 1	REF: Page 578
10.	ANS: C	PTS: 1	REF: Page 578
11.	ANS: A	PTS: 1	REF: Page 579
12.	ANS: D	PTS: 1	REF: Page 579
13.	ANS: B	PTS: 1	
14.	ANS: B	PTS: 1	REF: Page 584
15.	ANS: D	PTS: 1	REF: Page 584
16.	ANS: A	PTS: 1	REF: Page 585
17.	ANS: B	PTS: 1	REF: Page 592
18.	ANS: D	PTS: 1	REF: Page 593
19.	ANS: A	PTS: 1	REF: Page 602
20.	ANS: C	PTS: 1	REF: Page 603
21.	ANS: B	PTS: 1	REF: Page 603
22.	ANS: A	PTS: 1	REF: Page 604
23.	ANS: C	PTS: 1	REF: Page 613
24.	ANS: C	PTS: 1	REF: Page 628
25.	ANS: C	PTS: 1	REF: Page 631
26.	ANS: C	PTS: 5	REF: Page 610
27.	ANS: D	PTS: 5	
28.	ANS: C	PTS: 5	REF: Page 586
29.	ANS: D	PTS: 5	REF: Page 594
30.	ANS: D	PTS: 5	REF: Page 629
31.	ANS: A	PTS: 5	REF: Page 587
32.	ANS: A	PTS: 5	REF: Page 629
33.	ANS: A	PTS: 5	REF: Page 612
34.	ANS: C	PTS: 5	REF: Page 612
35.	ANS: D	PTS: 5	REF: Page 583
36.	ANS: C	PTS: 5	REF: Page 595
37.	ANS: B	PTS: 5	REF: Page 611
38.	ANS: A	PTS: 5	REF: Page 613
39.	ANS: A	PTS: 5	REF: Page 601

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|------------|--------|--------|---------------|
| 40. | ANS: B | PTS: 5 | REF: Page 596 |
| 41. | ANS: B | PTS: 5 | REF: Page 600 |
| 42. | ANS: D | PTS: 5 | REF: Page 630 |

NUMERIC RESPONSE

- 43.** ANS: 32

PTS: 5

- 44.** ANS: 4.9

PTS: 1

- 45.** ANS: 1

PTS: 1

- 46.** ANS: 5

PTS: 1