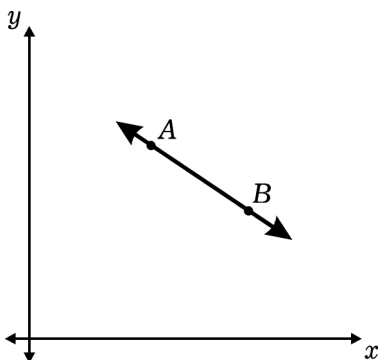


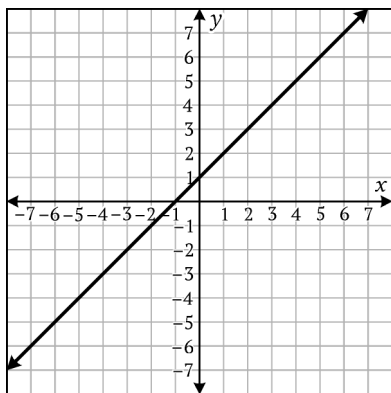
TX TEKS High School Math Samples

1. In the figure, $A = (3, 5)$ and $B = (6, u)$
 What is the value of u if the y -intercept of the line is 7?



- (A) $2\frac{2}{3}$ (B) 3 (C) $3\frac{1}{2}$ (D) 4

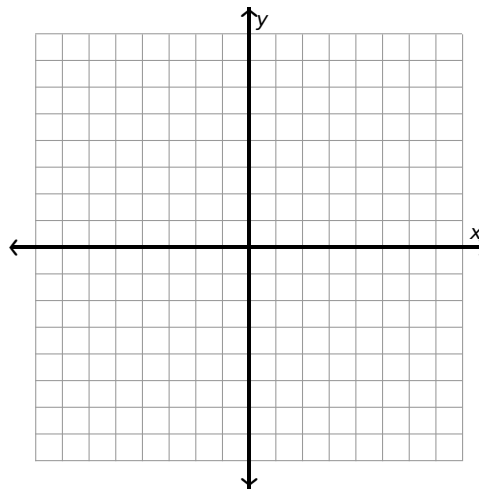
2. The graph of a function is shown on the grid.



Which ordered pair best represents the location of the x -intercept?

- (A) $(0, 1)$ (B) $(-1, 0)$
 (C) $(1, 0)$ (D) $(0, -1)$

3. Graph $f(x) = 2x + 1$ and $g(x) = x + 1$. How many times do the two graphs intersect?



- (A) 0 (B) 1 (C) 2 (D) 3

4. In correlational analysis, when the points scatter widely about the regression line, this means that the correlation is _____.

- (A) low
 (B) heterogeneous
 (C) between two measures that are unreliable
 (D) high

5. The system

$$\begin{aligned} ax + by &= r \\ cx + dy &= s \end{aligned}$$

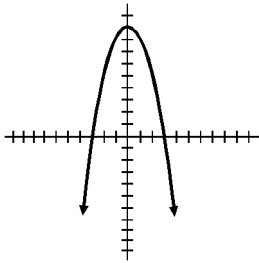
has only one solution when:

- (A) $ac = bd$
 (B) if $a = nc$ and $b = nd$
 (C) $ab \neq cd$
 (D) $\frac{a}{b} = \frac{c}{d}$

6. A boat traveled 30 minutes with a current of 3 miles per hour. The return trip against the same current took 1 hour. How far did the boat travel in all?

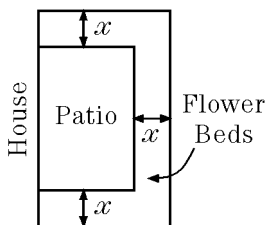
- (A) 3 miles (B) 6 miles
(C) 12 miles (D) 18 miles

7. Which of these is a reasonable equation for the graph?



- (A) $f(x) = \frac{1}{2}x$ (B) $f(x) = -\frac{1}{2}x^2$
(C) $f(x) = -x^2 + 9$ (D) $f(x) = 2x + 9$

8. Henry has a patio next to his house that is 15 ft by 10 ft. He wants to put a uniform flower bed around the patio. The area of the flower bed is 100ft^2 . Which equation best represents the situation?



- (A) $4x^2 + 35x - 100 = 0$
(B) $2x^2 - 35x - 100 = 0$
(C) $2x^2 + 35x + 100 = 0$
(D) $2x^2 + 35x - 100 = 0$

9. The width of a rectangle is six meters less than three times its length. The area of the rectangle is 105 square meters. Find the length and width of the rectangle. Write the correct values in the boxes.

Length: meters

Width: meters

10. Six diamonds are available for sale. They are arranged from smallest to largest, as shown in the diagram. The value of Diamond 1 is 118% the average market price for diamonds. For Diamond 2 through Diamond 5, the value of each diamond is 118% of the value of the previous diamond.



If the average market price for diamonds is \$2,500, which function can be used to find the value in dollars of Diamond d , where $1 \leq d \leq 6$?

- (A) $v(d) = 1.18(2,500)^d$
(B) $v(d) = 1.18(2,500 - d)$
(C) $v(d) = 2,500(1.18)^d$
(D) $v(d) = 2,500(d - 1.18)$

11. The length of each side of regular pentagon $ABCDE$ is represented by $3y^2 + y$. Which expression represents the perimeter of the pentagon?

- (A) $15y^2 + 5y$ (B) $18y^2 + 6y$
(C) $3y^2 + 5y$ (D) $15y^2 + y$

12. Find x^2y when $x = 3a - 4$ and $y = a^2$.

- (A) $3a^5 - 4a^4$
- (B) $6a^5 - 8a^4$
- (C) $9a^6 - 24a^5 + 16a^4$
- (D) $9a^4 - 24a^3 + 16a^2$

13. Which operation should be performed second in the following expression?

$$(3^2 + (\sqrt{25} - (3 \cdot (8 - 10))))$$

- (A) multiplication (B) exponent
- (C) square root (D) subtraction

14. Factor completely: $24f^3 - 48f^2 + 32f$

- (A) $8(3f^3 - 6f^2 + 4f)$
- (B) $8f(3f^2 - 6f + 4)$
- (C) $2f(12f^2 - 24f + 16)$
- (D) $4f(6f^2 - 12f + 8)$

15. A laboratory discovers that C kilograms of contaminant can be neutralized by the application of a grams of antiseptic aerosol, according to the formula:

$$C(a) = 1320 - 10a$$

What is the minimum amount of antiseptic that needs to be applied in order to completely neutralize the contaminant?

- (A) 132 grams (B) 1310 grams
- (C) 1330 grams (D) 13200 grams

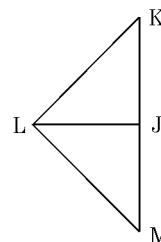
16. For the following geometric sequence, what is the formula for t_n and the value of t_{10} ?

1024, 256, 64, 16, ..., t_{10}

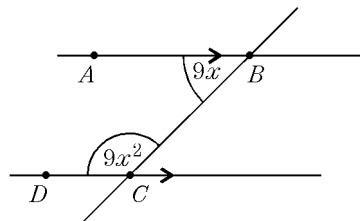
- (A) $t_n = 1024 \left(\frac{1}{4}\right)^{n-1}, \frac{1}{256}$
- (B) $t_n = 16 \left(\frac{1}{1024}\right)^{n-1}, 4$
- (C) $t_n = 1024(4)^{n-1}, 256$
- (D) $t_n = 16 \left(\frac{1}{4}\right)^{n-1}, \frac{1}{256}$

17. If \overline{LJ} is both a median and an altitude, then $\triangle LKM$ must be _____.

- (A) scalene
- (B) isosceles
- (C) equiangular
- (D) a right triangle



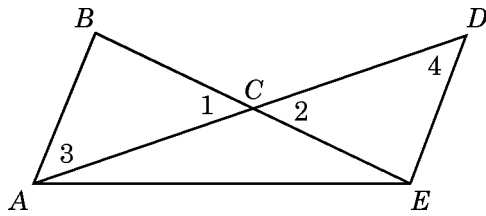
18. In the diagram, line AB is parallel to line CD . If the measure of $m\angle ABC = (9x)^\circ$ and the measure of $m\angle DCB = (9x^2)^\circ$, then what is the measure of $\angle ABC$?



- (A) 30° (B) 32° (C) 36° (D) 45°

19. Given: \overline{AC} is the median to \overline{BE}
 \overline{EC} is the median to \overline{AD}

Prove: $\overline{AB} \parallel \overline{ED}$



statement	reason
1. \overline{AC} is the median to \overline{BE}	1. _____
2. $BC = CE$	2. _____
3. $m\angle 1 = m\angle 2$	3. _____
4. \overline{EC} is the median to \overline{AD}	4. _____
5. $AC = CD$	5. _____
6. $\triangle ACB \cong \triangle DCE$	6. _____
7. $m\angle 3 = m\angle 4$	7. _____
8. $\overline{AB} \parallel \overline{ED}$	8. _____

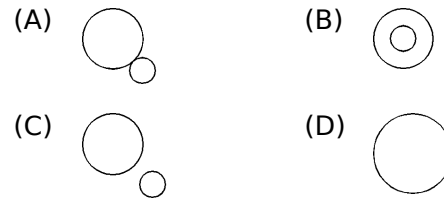
In the proof, what is the reason for line 3?

- (A) alternate interior angles are congruent
 (B) vertical angles are congruent
 (C) corresponding angles are congruent
 (D) definition of a median

20. Triangle B has a base that is twice as long as triangle A and a height that is three times as long as triangle A. This means that the area of triangle B is _____ times the area of triangle A.

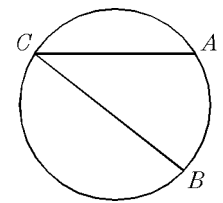
- (A) 3 (B) 6 (C) 9 (D) 12

21. Which of the following are concentric circles?



22. In the diagram, \overline{CB} contains the center of the circle, $m\angle ACB = 30$ and \widehat{AC} has a length of 15π units. What is the length of \overline{CB} ?

- (A) 18 units
 (B) 32 units
 (C) 25 units
 (D) 45 units



23. If you were to graph the following relations in this order, what would you see?

1) $x^2 + (y + 4)^2 = 1$

2) $x^2 + y^2 = 1$

3) $x^2 + (y - 4)^2 = 1$

- (A) a circle moving up
 (B) a circle moving left
 (C) a circle moving down
 (D) a circle moving right

24. Which pair of functions are inverses of each other?

(A) $f(x) = 3x - 8$, $g(x) = 8x + 3$

(B) $f(x) = 2x - 3$, $g(x) = \frac{1}{2}x + 3$

(C) $f(x) = \frac{1}{3}x - 4$, $g(x) = 3x + 12$

(D) $f(x) = \frac{1}{4}x + 3$, $g(x) = \frac{1}{3}x - 4$

$$\begin{aligned} 25. \quad & x - y - 3z = -2 \\ & 2x + 3z = 5 \\ & 3x + 2y + z = 4 \end{aligned}$$

What is the augmented matrix for the system of equations?

(A) $\begin{bmatrix} 1 & -1 & -3 \\ 2 & 0 & 3 \\ 3 & 2 & 1 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & -1 & -3 & -2 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 1 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & -1 & -3 & -2 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 1 & -4 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & -1 & -3 & -2 \\ 2 & 0 & 3 & 5 \\ 3 & 2 & 1 & 4 \end{bmatrix}$

26. Use Cramer's Rule to find x in the linear system below.

$$\begin{aligned} 2x - 3y &= 3 \\ x + 4y &= 7 \end{aligned}$$

- (A) -3 (B) 1 (C) 3 (D) 4

27. Automobile headlights have a parabolic shape. If the focus of a parabolic headlight is 3.81 cm from the vertex, how far from the vertex should the bulb be placed for optimal efficiency?

- (A) 0 cm (B) 0.3 cm
(C) 1.9 cm (D) 3.81 cm

28. Which one of the following equations are equivalent?

- $a = 10^x$
 $10^{\log a} = 10^x$
 $10^{\log x} = 10^a$
 $\log a = x \log 10$

29. Based on the definition of a logarithm, which of the following statements are true for $y = \log_b x$? Select the correct answer in each row.

	true	false
$x > 0$	<input type="radio"/>	<input type="radio"/>
$b > 0$	<input type="radio"/>	<input type="radio"/>
$b \neq 1$	<input type="radio"/>	<input type="radio"/>
$y > 0$	<input type="radio"/>	<input type="radio"/>

30. Factor completely: $108x - 4x^4$

- (A) $4x(3 - x)(9 - 3x + x^2)$
(B) $4x(3 - x)(9 + 3x + x^2)$
(C) $4x(3 - x)(9 + 6x + x^2)$
(D) $4x(3 - x)(9 - 6x + x^2)$

31. Simplify: $\frac{x^2 - 5x + 6}{x^2 - 4} \div \frac{6 + x - x^2}{x^2 + 4x + 4}$

- (A) 1 (B) -1
(C) $\frac{(x - 3)^2}{(x - 2)^2}$ (D) $-\frac{(x - 3)^2}{(x - 2)^2}$

32. Which of the following tables of data exhibit exponential behavior?

(A)

x	y
0	1
1	3
2	9
3	27
4	81

(B)

x	y
0	0
1	3
2	12
3	27
4	48

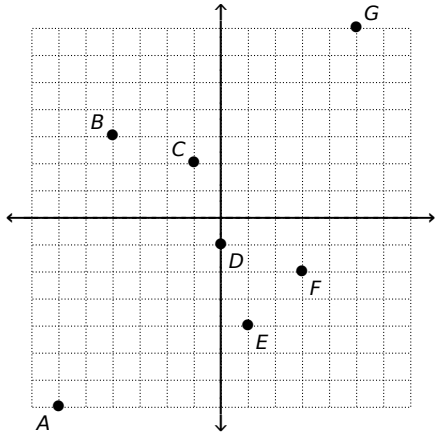
(C)

x	y
0	0
1	0.5
2	1
3	1.5
4	2

(D)

x	y
0	0
1	0.5
2	2
3	4.5
4	8

33.

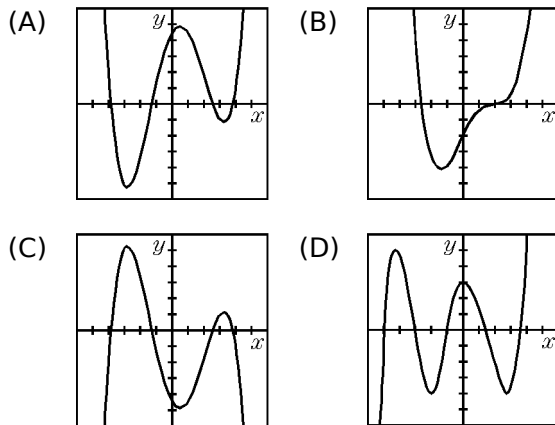


Use a calculator to find the cubic regression equation for the data points in the graph. Answer accurate to two decimal places.

Note: Each horizontal and vertical line represents 1 unit.

- (A) $y = 0.12x^3 + 0.18x^2 - 2.22x - 0.95$
- (B) $y = 2.72x^3 + 2.77x^2 - 5.27x - 7.63$
- (C) $y = 0.22x^3 + 2.10x^2 - 7.21x - 0.71$
- (D) $y = 8.26x^3 + 2.47x^2 - 2.24x - 7.94$

34. Which of the following graphs best illustrates the graph of $y = a(x - b)(x - c)(x - d)(x - e)$ where $a < 0$ and $b \neq c \neq d \neq e$?



35. What is the period of $y = 2 \cos^2 \theta - 1$ if θ is in degrees?

- (A) 270° (B) 225°
- (C) 180° (D) 60°

36. The parametric equations $x(t) = (v_i \cos \theta)t$ and $y(t) = -16t^2 + (v_i \sin \theta)t$ model a projectile launched from the ground at an angle θ with an initial velocity of v_i . Which launch angle causes the projectile to reach the highest vertical distance?

- I. 30°
 - II. 40°
 - III. 50°
- (A) I (B) II
 - (C) III (D) II and III

37. For each triangle data set, determine if it forms an acute, obtuse, right, or no triangle. Place each data set in the correct box. Data sets may belong in more than one box.

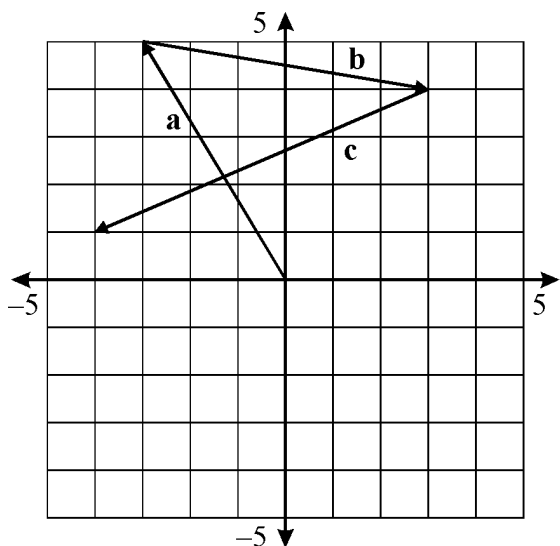
- A** $A = 30^\circ, a = 8$ and $b = 10$
- B** $A = 40^\circ, a = 13$ and $b = 20$
- C** $A = 60^\circ, a = 15$ and $b = 20$

Acute	Obtuse	Right	None

38. Find the component form of the vector \overrightarrow{AB} with initial point $A(2, -3)$ and terminal point $B(6, 5)$.

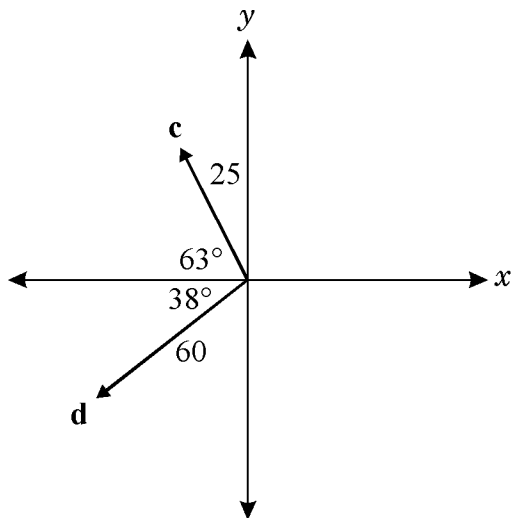
- (A) $\langle 8, 2 \rangle$ (B) $\langle -4, -8 \rangle$
- (C) $\langle 4, 8 \rangle$ (D) $\langle -8, -2 \rangle$

39. Using the graph below, what is $\mathbf{a} + \mathbf{b} - \mathbf{c}$?



- (A) $[-4, 1]$ (B) $[-4, 8]$
 (C) $[10, 1]$ (D) $[10, 7]$

40. Use the diagram below to express the vector $\mathbf{c} + \mathbf{d}$ in component form. Round your answer to the nearest tenth.

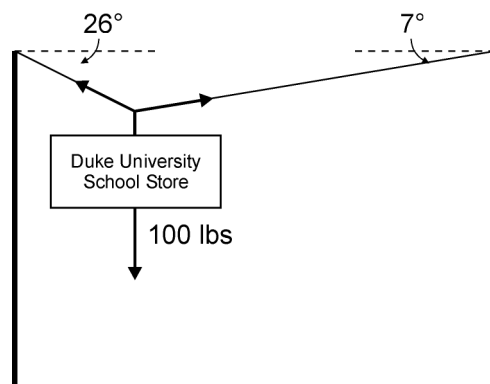


- (A) $\langle -59.7, -15.3 \rangle$ (B) $\langle -58.6, -14.7 \rangle$
 (C) $\langle -52.5, -12.6 \rangle$ (D) $\langle -53.1, -11.5 \rangle$

41. $6\vec{k} = [12, 24]$. Find \vec{k} .

- (A) $[2, 4]$ (B) $[2, 24]$
 (C) $[6, 18]$ (D) $[\frac{1}{2}, \frac{1}{4}]$

42. The school store sign is suspended by two cables as shown.



If the sign weighs 100 pounds, what is the tension in the shorter cable?

- (A) 165.0 (B) 170.4
 (C) 182.2 (D) 304.9

43. A radioactive material decays according to the formula $A = A_0 10^{-kt}$, where A is the final amount, A_0 is the initial amount and t is time in years. Find k , if 700 grams of this material decays to 550 grams in 8 years. (Accurate to 4 decimal places.)

- (A) -4.4820 (B) -0.1179
 (C) 0.0131 (D) 0.9164

44. Simplify: $\frac{\csc^2 \theta - 1}{\sec^2 \theta - 1}$

- (A) $2 \cot^2 \theta$ (B) $\cot^4 \theta$
 (C) $2 \tan^2 \theta$ (D) $\tan^4 \theta$

45.

Temperature	18	21	25	28	30.5	33.5	34.5
Number of visits	5	6	7	10	11	11	13

The emergency room at the general hospital wishes to see whether a relationship exists between the outside temperature and the number of visits to the emergency room. The data is recorded in the table.

Which of the following best describes the data?

- I. As the temperature increases the number of visits increases.
- II. As the temperature decreases the number of visits increases.
- III. As the temperature increases the number of visits decreases.
- IV. The temperature may or may not be related to the number of visits to the emergency room.

- (A) I only
- (B) I and II only
- (C) V only
- (D) I, II, III and IV only

46. Solve: $(2n)! + n! = 726$

- (A) 242
- (B) 12
- (C) 4
- (D) 3

47. The union of two sets is best associated with the word _____.

- (A) relative
- (B) overlap
- (C) both
- (D) or

48. A loaded die has the following probabilities associated with each outcome.

Outcome	1	2	3	4	5	6
Probability	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

When a single die is tossed, what is the probability that the outcome is odd or greater than 2?

- (A) $\frac{3}{4}$
- (B) $\frac{5}{6}$
- (C) $\frac{2}{3}$
- (D) $\frac{5}{12}$

49. Statistics show that 90.5% of women aged 73 will live another year. If an insurance company wants to make a \$60 profit on each \$5000 policy, then how much should they charge a 73 year old woman for a one year term policy?

- (A) \$535
- (B) \$424.18
- (C) \$500
- (D) \$553

50. A computer web site developer wants to survey 50 out of 1000 students in a school to see if they like the site he designed for the school. Which of the following plans for choosing his sample are biased?

- Select 50 of the students in the computer lab.
- Select a class that has 50 students and survey them.
- Assign each student in the school a number from 1 to 1000. Have a computer select 50 numbers and interview those students.
- Publish a checklist in the school newsletter and ask respondents to drop it in a box in the office.

Problem-Attic format version 4.4.591

© 2011–2020 EducAide Software
Licensed for use by Legler
Terms of Use at www.problem-attic.com

TX TEKS High School Math Samples 12/29/2023

1.
Answer: B
Objective: A.02C
Points: 1

2.
Answer: B
Objective: A.03C
Points: 1

3.
Answer: B
Objective: A.03F
Points: 1

4.
Answer: A
Objective: A.04A
Points: 1

5.
Answer: B
Objective: A.05C
Points: 1

6.
Answer: C
Objective: A.05C
Points: 1

7.
Answer: C
Objective: A.06B
Points: 1

8.
Answer: D
Objective: A.06C
Points: 1

9.
Answer: 7,15
Objective: A.08A
Points: 1

10.
Answer: C
Objective: A.09C
Points: 1

11.
Answer: A
Objective: A.10A
Points: 1

12.
Answer: D
Objective: A.10B
Points: 1

13.
Answer: A
Objective: A.11A
Points: 1

14.
Answer: B
Objective: A.11B
Points: 1

15.
Answer: A
Objective: A.12B
Points: 1

16.
Answer: A
Objective: A.12D
Points: 1

17.
Answer: B
Objective: G.04A
Points: 1

18.
Answer: C
Objective: G.05A
Points: 1

19.
Answer: B
Objective: G.06B
Points: 1

20.
Answer: B
Objective: G.10B
Points: 1

21.
Answer: B
Objective: G.12A
Points: 1

22.
Answer: D
Objective: G.12B
Points: 1

23.
Answer: A
Objective: G.12E
Points: 1

24.
Answer: C
Objective: L.02D
Points: 1

25.
Answer: D
Objective: L.03B
Points: 1

26.
Answer: C
Objective: L.03B
Points: 1

27.
Answer: D
Objective: L.04B
Points: 1

28.
Answer: 1,2,4
Objective: L.05C
Points: 1

29.
Answer: [1],[1],[1],[2]
Objective: L.05E
Points: 1

30.
Answer: B
Objective: L.07E
Points: 1

31.
Answer: B
Objective: L.07F
Points: 1

32.
Answer: A
Objective: L.08A
Points: 1

33.
Answer: A
Objective: L.08B
Points: 1

34.
Answer: C
Objective: P.02F
Points: 1

35.
Answer: C
Objective: P.02I
Points: 1

36.
Answer: C
Objective: P.03C
Points: 1

37.
Answer: [A,B][A,B][C]
Objective: P.04G
Points: 1

38.
Answer: C
Objective: P.04I
Points: 1

39.
Answer: D
Objective: P.04J
Points: 1

40.
Answer: B
Objective: P.04K
Points: 1

41.
Answer: A
Objective: P.04J
Points: 1

42.
Answer: C
Objective: P.04K
Points: 1

43.
Answer: C
Objective: P.05I
Points: 1

44.
Answer: B
Objective: P.05M
Points: 1

45.
Answer: A
Objective: Q.03B
Points: 1

46.
Answer: D
Objective: Q.02E
Points: 1

47.
Answer: D
Objective: Q.04D
Points: 1

48.
Answer: A
Objective: Q.04B
Points: 1

49.
Answer: A
Objective: Q.04F
Points: 1

50.
Answer: 1,2,4
Objective: Q.04O
Points: 1