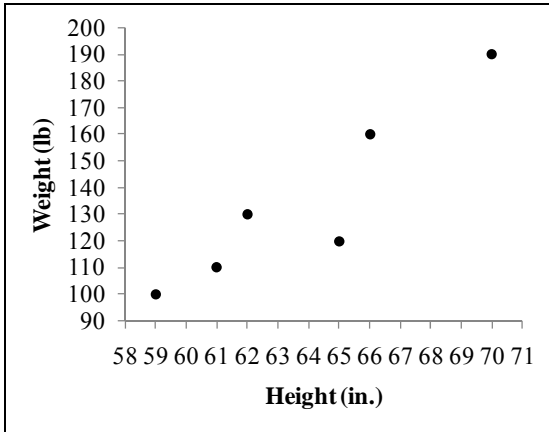


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1. Use the graph below.



Which table represents the information shown in the graph?

- A.

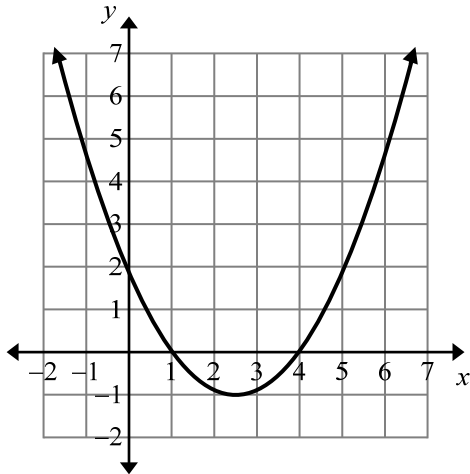
Height (in.)	59	60	62	65	66	70
Weight (lb)	115	110	130	120	160	170
- B.

Height (in.)	59	60	62	65	66	70
Weight (lb)	100	110	130	120	160	190
- C.

Height (in.)	59	61	62	65	66	70
Weight (lb)	100	110	130	120	160	190
- D.

Height (in.)	59	61	62	65	66	70
Weight (lb)	115	110	130	120	160	170

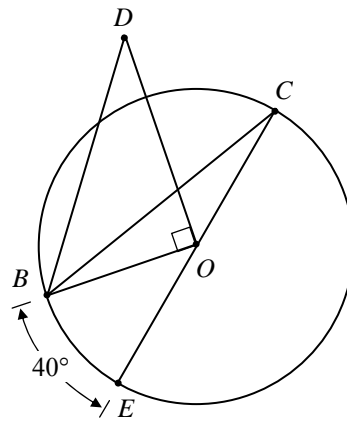
2. The graph of a function is shown below.



What is the domain of this function?

- A. $x = 1$ or $x = 4$
- B. x can be any real number
- C. $y \geq -1$
- D. $y = 2$

3. Use the diagram below.



What is the measure of $\angle BCE$?

- A. 20°
- B. 25°
- C. 40°
- D. 50°

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4. A group of 30 people was asked, "What is your favorite type of pet?" The results of the survey are shown below.

Favorite Type of Pet	Number of People
Dog	12
Cat	9
Fish	5
Bird	2
Iguana	2

Which of these is a true statement about the data?

- A. The mean is 6.
- B. The mode is 2
- C. The mode is dog.
- D. The median is fish.

5. Use the table.

1	2	3	4
5	7	9	11

The pattern in the table continues. What is the next column in the table?

- A.

5
10
- B.

5
13
- C.

10
5
- D.

13
5

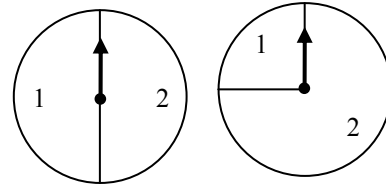
6. Use the matrices below.

$$K = \begin{bmatrix} 4 & 0 \\ -1 & 3 \end{bmatrix} \quad L = \begin{bmatrix} 3 & -1 \\ 0 & 4 \end{bmatrix} \quad M = \begin{bmatrix} -3 & 1 \\ 0 & -4 \end{bmatrix}$$

Which sum is equal to $\begin{bmatrix} 6 & -2 \\ 0 & 8 \end{bmatrix}$?

- A. $K + M$
- B. $L + L$
- C. $L + M$
- D. $M + M$

7. A game uses the two spinners shown below.



Each spinner is spun once and the two results are added to determine a player's move. Which circle graph shows the distribution of possible moves?

- A.
- B.
- C.
- D.

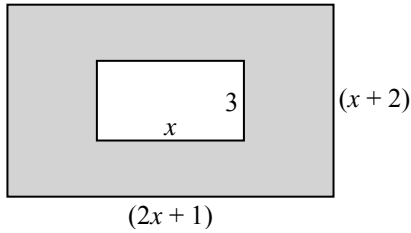
8. A carpenter measures a board to be 37.9 inches in length. The board is actually 38 inches in length. Which expression shows the **percent error** of the carpenter's measurement?

- A. $\frac{(38 - 37.9)}{100}$
- B. $(38 - 37.9) \times 100$
- C. $\left(\frac{38 - 37.9}{37.9}\right) \times 100$
- D. $\left(\frac{38 - 37.9}{38}\right) \times 100$

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9. A triangle has sides with lengths of 11 meters, 9 meters, and 7 meters. What type of triangle is it?
- A. acute
 B. equiangular
 C. obtuse
 D. right
10. The figure below shows a smaller rectangle inside a larger rectangle.



What is the area of the shaded region?

- A. $2x^2 + 2x + 2$
 B. $2x^2 + 3x + 2$
 C. $2x^2 + 5x + 2$
 D. $2x^2 + 8x + 2$
11. A definition of biased sampling is
- A. a method of selection that includes the whole population.
 B. a method of selection that excludes certain parts of the population.
 C. a method of selection that ensures the sample represents the population.
 D. a method of selection that results in a sample smaller than the population.
12. Use the statement below.
- If a number is divisible by 2, then it is also divisible by 4.**
- Which is a **counterexample** to the statement?
- A. 6
 B. 16
 C. 36
 D. 56

13. Which one of the following statements is NOT always true for positive numbers a , b , and c ?
- A. $a(b \cdot c) = (a \cdot b)c$
 B. $a(b + c) = a \cdot b + a \cdot c$
 C. $a \div (b \cdot c) = (b \cdot c) \div a$
 D. $a + (b + c) = a + (c + b)$
14. Two dice are rolled. The **number** of dice showing "6" is counted. Which is the correct sample space?
- A. {6}
 B. {0, 1, 2}
 C. {0, 6, 12}
 D. {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}
15. An equation is shown below.

$$R = \frac{pL}{A}$$

Which is an equivalent equation solved for L ?

- A. $L = \frac{A}{pR}$
 B. $L = \frac{p}{AR}$
 C. $L = \frac{pR}{A}$
 D. $L = \frac{AR}{p}$
16. Use the information below.
- ☆ = ○ ○
 □ = ○ △
 △ = ○ ○ ○
- Which figure is equivalent to ☆ □ □ ?
- A. ○ ○ ○ ○ ○
 B. ○ ○ ○ ○ ○
 C. ○ ○ ○ ○ ○
 D. ○ ○ ○ ○ ○

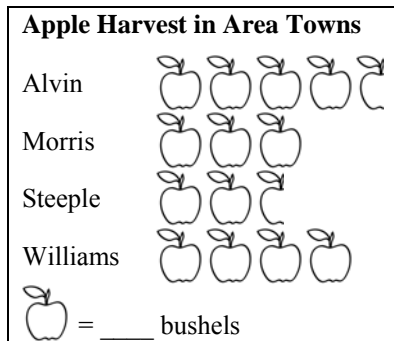
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17. Which equation has roots of -3 and 5 ?

- A. $x^2 - 2x - 15 = 0$
- B. $x^2 - 2x + 15 = 0$
- C. $x^2 + 2x - 15 = 0$
- D. $x^2 + 2x + 15 = 0$

18. The key is missing from the graph below.



Morris and Williams harvested 560 bushels of apples. How many bushels does each apple in the graph represent?

- A. 7
- B. 14
- C. 40
- D. 80

19. The formula for the surface area S of a sphere is shown below, where r is the length of the radius.

$$S = 4\pi r^2$$

When the surface area of a sphere is $64\pi \text{ cm}^2$, what is the length of the radius?

- A. 4 cm
- B. 8 cm
- C. 16 cm
- D. 64 cm

20. Which statement is true if $x = 10^0 + \sqrt[3]{30}$?

- A. $0 < x \leq 4$
- B. $4 < x \leq 6$
- C. $6 < x \leq 12$
- D. $12 < x \leq 20$

21. A system of linear equations is shown below.

$$\begin{cases} y = 2x + 1 \\ 2x - 3y = 5 \end{cases}$$

What is the y -coordinate of the point of intersection?

- A. -5
- B. -3
- C. -2
- D. 9

22. Dave's windshield has a crack. He must decide who will fix it. Relevant information is listed below.

- Replacing the windshield costs \$200.
- Repairing the crack costs \$70.
- If he has the windshield repaired, the insurance company will pay half of the cost.
- If he has the windshield replaced by Glass Plus, he pays \$25 plus 20% of the cost. His insurance pays the rest.
- If he has the windshield replaced by Mobile Glass, he must pay the full cost; insurance pays nothing.

What is the least amount of money Dave must pay to get the windshield repaired or replaced?

- A. \$35
- B. \$65
- C. \$100
- D. \$200

23. An equation is shown below.

$$x^2 + 2x - 24 = 0$$

What is the solution set of the equation?

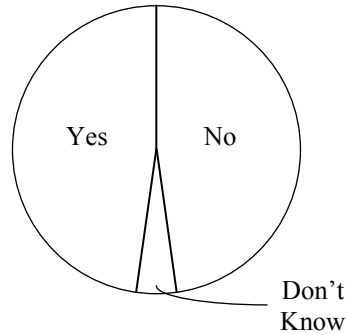
- A. $\{-4, 6\}$
- B. $\{-6, 4\}$
- C. $\{-12, 2\}$
- D. $\{-2, 12\}$

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24. A survey about space program funding asked the question,
“Should the space program receive increased funding?”

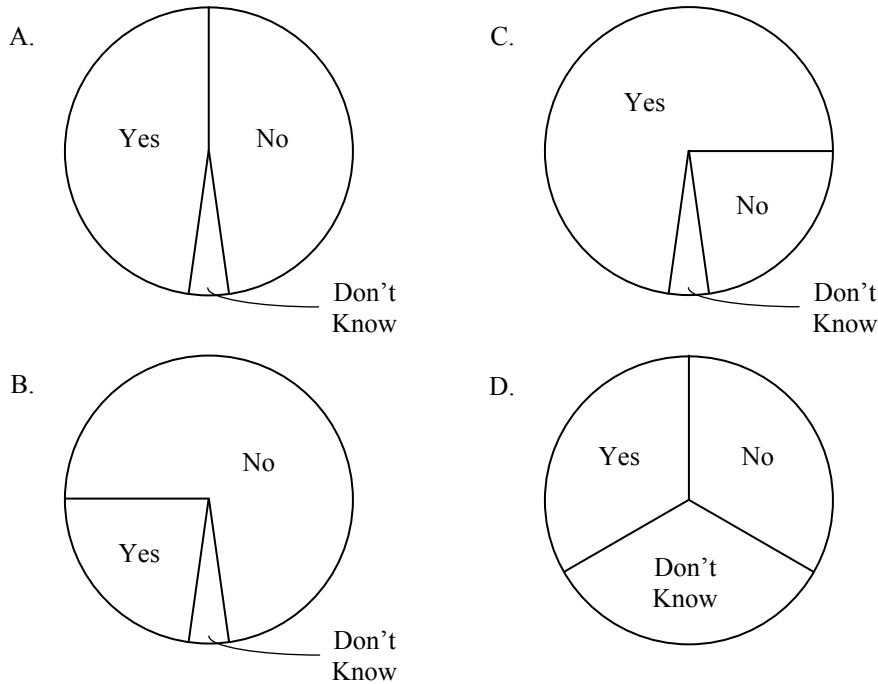
A graph of the results is shown below.



If the survey had instead asked,

“Given the great benefits provided by the space program, should the space program receive increased funding?”

which of these graphs shows likely results of that question?



25. Which set of numbers could be the lengths of the sides of a right triangle?

- A. 2, 3, 4
- B. 3, 4, 7
- C. 5, 10, 15
- D. 9, 12, 15

26. What is the number of combinations of 7 things taken 3 at a time?

- A. 21
- B. 35
- C. 210
- D. 343

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27. Fred and Ethel are solving the system of linear equations shown below:

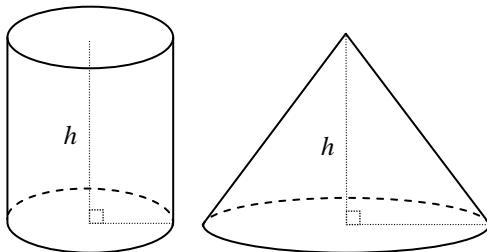
$$\begin{cases} 2x - 3y = 12 \\ -4x + 6y = -24 \end{cases}$$

Fred found the solution to be the point (6, 0). Ethel found the solution to be the point (0, -4). Which person has the correct solution to the system and why?

- A. Fred, because the point (6, 0) lies on both lines.
- B. Ethel, because the point (0, -4) lies on both lines.
- C. Neither, because any two lines may only have one point in common.
- D. Neither, because they have found only two of the infinitely many points that lie on both lines.
28. A secretary types 56 words in a minute. Which proportion shows the approximate number of words that she can type in $\frac{1}{2}$ hour?

- A. $\frac{56}{1} = \frac{x}{30}$
- B. $\frac{56}{30} = \frac{x}{1}$
- C. $\frac{56}{60} = \frac{x}{30}$
- D. $\frac{56}{60} = \frac{x}{1}$

29. The cylinder and cone shown in the diagram below have equal volumes and equal heights.



What is the ratio of the radius of the cylinder to the radius of the cone?

- A. 1:3
- B. 3:1
- C. $1:\sqrt{3}$
- D. $\sqrt{3}:1$

30. The tables below show favorite foods of three classes from two teachers.

Favorite Foods – Teacher A

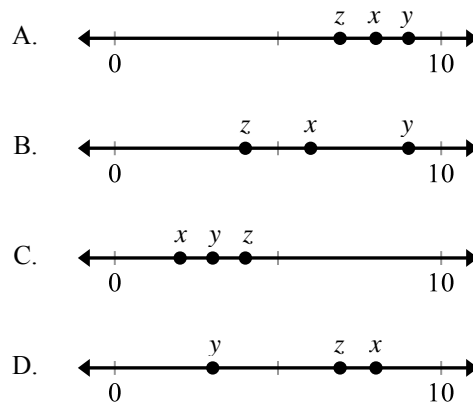
	Burritos	Hamburgers	Pizza
Period 1	10	11	12
Period 2	9	13	10
Period 3	7	8	9

Favorite Foods – Teacher B

	Burritos	Hamburgers	Pizza
Period 1	10	15	8
Period 2	7	14	9
Period 3	8	12	7

Which matrix shows that Period 2 likes hamburgers the most?

- A. $\begin{bmatrix} 7 & 14 & 9 \end{bmatrix}$
- B. $\begin{bmatrix} 9 & 13 & 10 \end{bmatrix}$
- C. $\begin{bmatrix} 16 & 27 & 19 \end{bmatrix}$
- D. $\begin{bmatrix} 25 & 41 & 24 \end{bmatrix}$
31. Given $x = 2^3$, $y = \sqrt[3]{27}$, and $z = 4\sqrt{3}$, which number line shows the correct placement of x , y and z ?



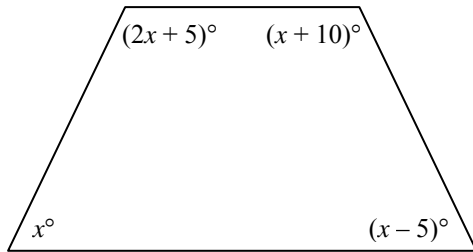
32. An ice cream shop advertises that they can make sundaes 36 different ways. A sundae consists of one sauce (chocolate, caramel, butterscotch), one nut (peanuts, walnuts, pecans), and one fruit. What is the fewest number of fruits the shop can offer to make 36 different sundaes?

- A. 4
- B. 9
- C. 12
- D. 30

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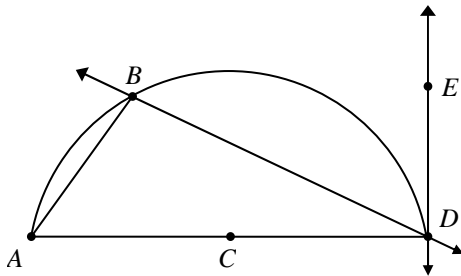
33. Look at the quadrilateral below.



What is the value of x ?

- A. 32
- B. 34
- C. 68
- D. 70

34. Use the figure below.



What word best describes \overline{DB} ?

- A. chord
- B. diameter
- C. secant
- D. tangent

35. Which inequality is equivalent to $|p + 5| \leq 8$?

- A. $-13 \leq p \leq 3$
- B. $-3 \leq p \leq 13$
- C. $p \leq -13$ or $p \geq 3$
- D. $p \leq -3$ or $p \geq 13$

36. Brand X locks use a 2-character code made up of the digits 0 through 9 which MAY NOT repeat. Brand Y locks use a 3-character code also made up from the digits 0 through 9 which MAY repeat. How many more different codes can Brand Y locks use than Brand X locks?

- A. 620
- B. 630
- C. 900
- D. 910

37. Use the sequence below.

$$5 \quad 1 \quad \frac{1}{5} \quad \frac{1}{25} \quad \frac{1}{125}$$

What is the n^{th} term in the sequence?

- A. 5^n
- B. 5^{2n-1}
- C. $\left(\frac{1}{5}\right)^{n-2}$
- D. $\left(\frac{1}{5}\right)^n$

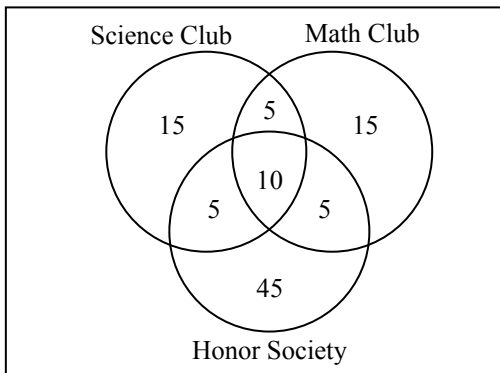
38. The table below shows points on a line.

x	-2	-1	0	1	2
y	-2	1	4	7	10

What is the slope of the line?

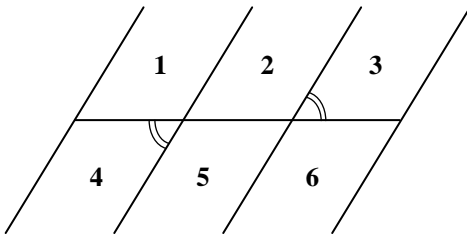
- A. $-\frac{1}{3}$
- B. $\frac{1}{3}$
- C. -3
- D. 3

39. The Venn Diagram below shows the numbers of students who are in Science Club, Math Club, and Honor Society.



If a student is chosen at random, what is the probability that the student is in math club and in science club?

- A. 25%
 - B. 20%
 - C. 15%
 - D. 10%
40. The diagram below shows six parking spaces. The marked angles are congruent.



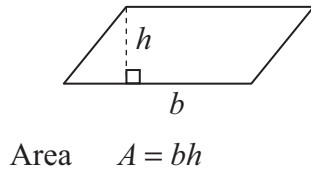
Is the width of parking space #2 the same as the width of parking space #5?

- A. Yes. Alternate exterior angles are marked congruent, so the lines are parallel and equidistant.
- B. Yes. Corresponding angles are marked congruent, so the lines are parallel and equidistant.
- C. No. Alternate interior angles are not marked congruent, so the lines may not be parallel and equidistant.
- D. No. Vertical angles are not marked congruent, so the lines may not be parallel and equidistant.

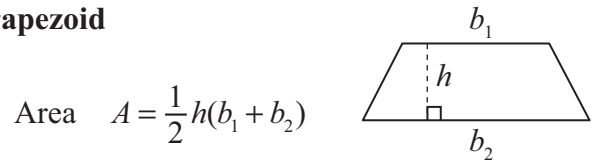
Formula Sheet

Note to Student: You may use these formulas throughout this entire test. Feel free to use this Formula Sheet as needed during your testing time.

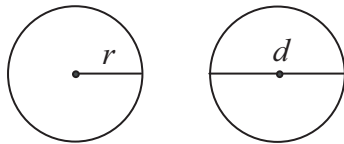
Parallelogram



Trapezoid

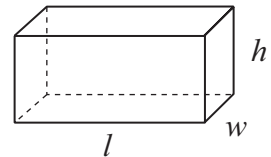


Circle



Circumference $C = 2\pi r$
 $C = \pi d$
 Area $A = \pi r^2$

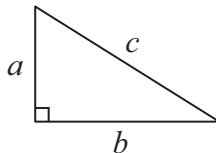
Rectangular Solid



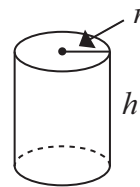
Volume $V = lwh$
 Surface Area $SA = 2lw + 2lh + 2hw$

Pythagorean Theorem

$$a^2 + b^2 = c^2$$

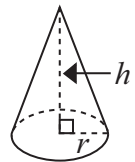


Cylinder



Volume $V = \pi r^2 h$

Cone



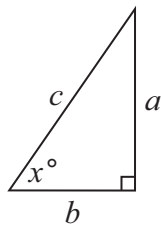
Volume $V = \frac{1}{3}\pi r^2 h$

Trigonometric Ratios

$$\sin x = \frac{a}{c}$$

$$\cos x = \frac{b}{c}$$

$$\tan x = \frac{a}{b}$$



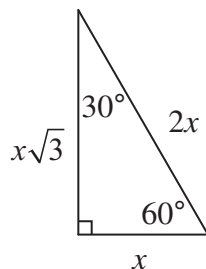
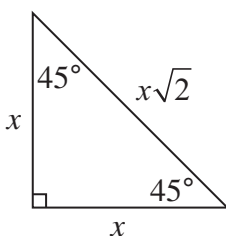
Permutations

$${}_n P_k = \frac{n!}{(n-k)!}$$

Combinations

$${}_n C_k = \frac{n!}{k!(n-k)!}$$

Special Right Triangles



Temperature Formulas

$$^{\circ}F = \frac{9}{5}C + 32$$

$$^{\circ}C = \frac{5}{9}(F - 32)$$

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Standards and Key by Question

Question	Key	2006 Standard	DOK
1	C	5.12.1	2
2	B	2.12.4	1
3	A	4.12.1	2
4	C	5.12.2	2
5	B	2.12.1	2
6	B	1.12.7	1
7	C	5.12.5	3
8	D	3.12.2	1
9	A	4.12.7	2
10	A	5.12.3	1
11	B	2.12.3	2
12	A	4.12.9	2
13	C	1.12.8	1
14	B	5.12.1	1
15	D	2.12.1	1
16	D	4.12.9	3
17	A	2.12.6	1
18	D	5.12.1	1
19	A	3.12.5	1
20	B	1.12.6	1
21	B	2.12.5	2
22	A	3.12.4	2
23	B	2.12.6	2
24	C	5.12.3	2
25	D	4.12.5	1
26	B	5.12.4	1
27	D	2.12.5	3
28	A	2.12.2	2
29	C	3.12.5	3
30	C	1.12.7	2
31	D	1.12.6	2
32	A	5.12.4	2
33	D	4.12.1	1
34	C	4.12.1	1
35	A	2.12.4	2
36	D	5.12.4	2
37	C	2.12.1	3
38	D	4.12.5	2
39	C	5.12.5	2
40	A	4.12.6	2

Standards and Key by Content/DOK

Question	Key	2006 Standard	DOK
20	B	1.12.6	1
6	B	1.12.7	1
13	C	1.12.8	1
31	D	1.12.6	2
30	C	1.12.7	2
15	D	2.12.1	1
2	B	2.12.4	1
17	A	2.12.6	1
5	B	2.12.1	2
28	A	2.12.2	2
11	B	2.12.3	2
35	A	2.12.4	2
21	B	2.12.5	2
23	B	2.12.6	2
37	C	2.12.1	3
27	D	2.12.5	3
8	D	3.12.2	1
19	A	3.12.5	1
22	A	3.12.4	2
29	C	3.12.5	3
33	D	4.12.1	1
34	C	4.12.1	1
25	D	4.12.5	1
3	A	4.12.1	2
38	D	4.12.5	2
40	A	4.12.6	2
9	A	4.12.7	2
12	A	4.12.9	2
16	D	4.12.9	3
14	B	5.12.1	1
18	D	5.12.1	1
10	A	5.12.3	1
26	B	5.12.4	1
1	C	5.12.1	2
4	C	5.12.2	2
24	C	5.12.3	2
32	A	5.12.4	2
36	D	5.12.4	2
39	C	5.12.5	2
7	C	5.12.5	3

Depth of Knowledge (DOK) levels are estimated.