

CCSD Practice Proficiency Exam

Spring 2009

- The number $\sqrt{54}$ is located between what two integers?
 - 5 and 6
 - 6 and 7
 - 7 and 8
 - 8 and 9
- Use the statements below about Points A , B , and C .
 - $AB + BC = AC$
 - $AB = BC$

Which is a valid conclusion?

- A is between B and C .
 - \overline{AB} is perpendicular to \overline{BC} .
 - A , B , and C form an equilateral triangle.
 - B is the midpoint of \overline{AC} .
- Glenn makes several measurements of the same distance. All of his measurements are very close to each other, but quite different than the actual distance. What term best describes Glenn's measurements?
 - They have low error.
 - They are very accurate.
 - They have a high tolerance.
 - They show great precision.

- The stem-and-leaf plot below shows a person's travel times to work over a three-week period.

Stem	Leaf
2	0 7 9 9
3	0 1 4 5 7 7 7
4	0 1 2 3

Key: 3|0 = 30 min

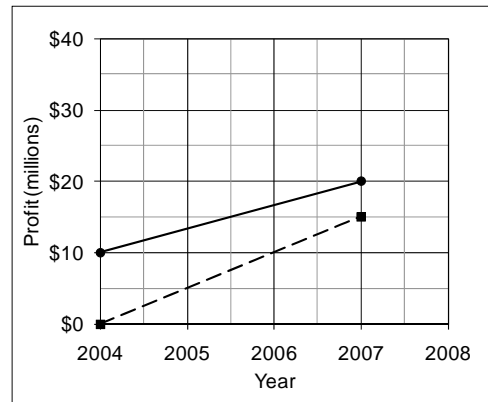
What is the range of the travel times?

- 20 minutes
- 23 minutes
- 35 minutes
- 37 minutes

- What expression defines the n^{th} term of the sequence $-1, 2, 7, 14, 23, 34, \dots$?

- $n^2 - 2$
- $3n - 1$
- $2n(n - 2)$
- $(n - 1)(n + 1)$

- The graph below shows the steady increase in annual profit over the last several years for two companies.



If the trends in profit continue for both companies, in what year will they have equal profits?

- 2008
 - 2009
 - 2010
 - 2011
- What graph shows the solution set of the equation $|-x - 2| = 6$?

- Number line from -10 to 10 with solid dots at -8 and 4.
- Number line from -10 to 10 with solid dots at -4 and 8.
- Number line from -10 to 10 with solid dots at 4 and 8.
- Number line from -10 to 10 with solid dots at -8 and -4.

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8. A swimming pool is in the shape of a cylinder. The pool has a depth of 5 feet and a diameter of 12 feet. What is the volume of the pool? (Leave your answer in terms of π .)
- A. $60\pi \text{ ft}^3$
 - B. $180\pi \text{ ft}^3$
 - C. $300\pi \text{ ft}^3$
 - D. $720\pi \text{ ft}^3$

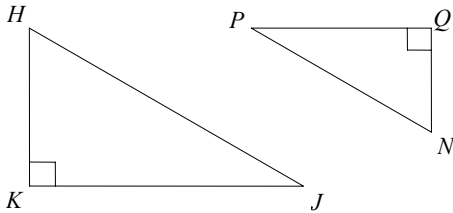
9. The drama club is planning to see a Broadway show. The table below displays the preferences of the club's 75 members.

Preferred Play	Number of Members
<i>Hair Spray</i>	10
<i>Les Miserables</i>	35
<i>The Lion King</i>	10
<i>The Phantom of the Opera</i>	20

If one student is chosen at random to choose the play the club will attend, what is the probability that the member prefers *The Phantom of the Opera*?

- A. $\frac{1}{20}$
- B. $\frac{1}{4}$
- C. $\frac{4}{11}$
- D. $\frac{4}{15}$

10. In the figure below, $\triangle HKJ$ is similar to $\triangle NQP$.



If $HK = 6$, $NQ = 3$, and $QP = 5$, what is KJ ?

- A. 2.5
- B. 3.6
- C. 8
- D. 10

11. Which is one of the factors of $2x^2 - x - 3$?

- A. $x - 1$
- B. $x + 3$
- C. $2x - 3$
- D. $2x + 1$

12. Two bicyclists leave the same point going in opposite directions at 1:00 p.m. If one bicyclist averages 10 kilometers per hour and the other averages 20 kilometers per hour, at what time are they 75 kilometers apart?

- A. 2:30 p.m.
- B. 3:30 p.m.
- C. 7:30 p.m.
- D. 8:30 p.m.

13. Maria did a survey to determine if boys and girls differ in their support for a new school policy. She randomly chose fifty students from the school roster. The results of her survey are in the table below.

	Boys	Girls
Number Surveyed	20	30
Number in Favor of Policy	8	10

Maria concluded that girls generally favor the policy more than boys. What statement best describes the validity of her conclusion?

- A. Her conclusion is correct because more girls surveyed favored the policy than boys.
- B. Her conclusion is correct because more girls surveyed favored the policy than boys and more girls were surveyed.
- C. Her conclusion is incorrect because she surveyed more girls than boys.
- D. Her conclusion is incorrect because a higher percentage of boys than girls surveyed favored the policy.

14. A scientist heated a substance to 230° F . What is this temperature on the Celsius scale?

- A. 110° C
- B. 165° C
- C. 198° C
- D. 446° C

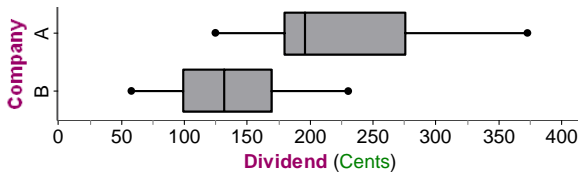
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15. What is the value of x in the equation $3(x+2) - 5 = 2(x+1)$?

- A. $x = 0$
- B. $x = 1$
- C. $x = 4$
- D. $x = 5$

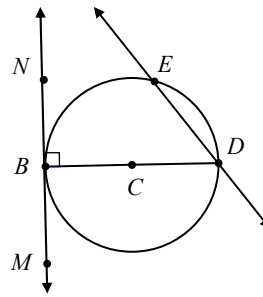
16. The box-and-whisker plots below show the annual cash dividends paid on the stock of two companies over a sixteen-year period.



Which of the following statements is true?

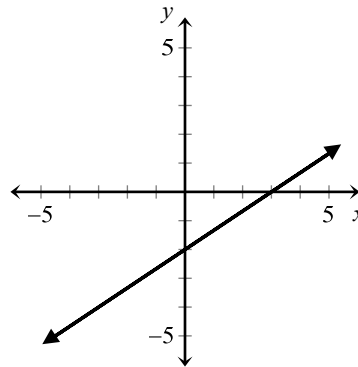
- A. The median dividend of Company A is less than the median dividend of Company B.
 - B. The range of the dividends of Company A is less than the range of the dividends of Company B.
 - C. The interquartile range of the dividends of Company A is twice the interquartile range of the dividends of Company B.
 - D. The first quartile of the dividends of Company A is greater than the third quartile of the dividends of Company B.
17. The first month of a cell phone plan charges \$46.95 to activate the phone and \$32.95 for the first 400 minutes. There is a \$0.54 charge for each minute used over 400 minutes. A customer uses 447 minutes in the first month. What is the approximate cost of the first month?
- A. \$80
 - B. \$95
 - C. \$105
 - D. \$115
18. What is the solution set of $x^2 - 6x + 5 = 0$?
- A. $\{2, 3\}$
 - B. $\{1, 5\}$
 - C. $\{-3, -2\}$
 - D. $\{-5, -1\}$

19. Use the figure below.



What term best describes \overleftrightarrow{ED} ?

- A. arc
 - B. chord
 - C. secant
 - D. tangent
20. An electronic lock has five buttons. The code to open the lock is a sequence of three of the buttons, but no button may be used more than once. How many different codes can be programmed to open the lock?
- A. 12
 - B. 15
 - C. 60
 - D. 120
21. Use the graph below.



What linear equation is represented by the graph?

- A. $y = 3x - 2$
- B. $y = 2x + 3$
- C. $y = \frac{3}{2}x + 3$
- D. $y = \frac{2}{3}x - 2$

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22. Which equation is equivalent to $\frac{x+y}{14} = \frac{3x}{7}$?

- A. $y = 5x$
- B. $y = 7x$
- C. $y = 17x$
- D. $y = 35x$

23. A person earned \$417 during the first week of work and \$335 during the second week. How much money will need to be earned during the third week to have mean earnings of \$400 per week for the three weeks?

- A. \$384
- B. \$448
- C. \$508
- D. \$548

24. Use the table below:

Row	Sequence
1	1, 2, 3, 4
2	2, 4, 6, 8
3	3, 6, 9, 12
4	4, 8, 12, 16
⋮	⋮

If the pattern in the table continues, what is the second term of the sequence in the 20th row?

- A. 10
- B. 20
- C. 40
- D. 80

25. A machine fills 20-ounce cereal boxes with a tolerance of $\pm 5\%$. What is the minimum amount of cereal that could be in a 20-ounce box?

- A. 10.0 oz
- B. 15.0 oz
- C. 19.0 oz
- D. 19.5 oz

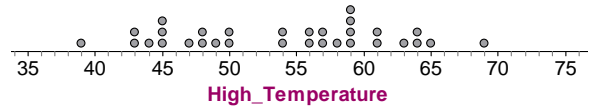
26. What is the value of $8 - 6(5 - 3)^2$?

- A. -56
- B. -16
- C. 8
- D. 16

27. Which equation shows the formula $q = mc(T_1 - T_2)$ when solved for T_1 ?

- A. $T_1 = \frac{q}{mc} + T_2$
- B. $T_1 = \frac{q + T_2}{mc}$
- C. $T_1 = qmc + T_2$
- D. $T_1 = q - mc + T_2$

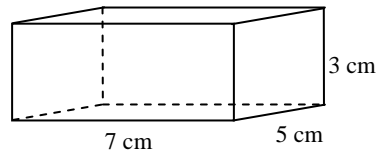
28. The line plot below shows the daily high temperatures in Las Vegas for the thirty-one days of December 2008.



What was the median high temperature?

- A. 45°
- B. 54°
- C. 56°
- D. 59°

29. Use the rectangular prism below.



What is the surface area of the prism?

- A. 142 cm²
- B. 152 cm²
- C. 182 cm²
- D. 192 cm²

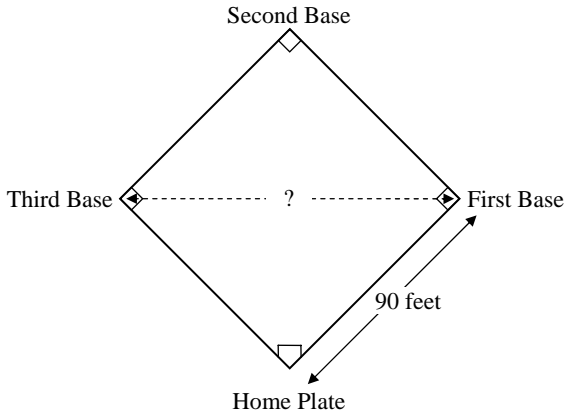
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30. There are sixteen identically-sized chips inside a box: four are red, five are blue, and seven are yellow. If three chips are drawn from the box at random, without replacement, what expression shows the probability that all three chips are blue?

- A. $\frac{5}{16} \times \frac{5}{15} \times \frac{5}{14}$
- B. $\frac{5}{16} \times \frac{5}{16} \times \frac{5}{16}$
- C. $\frac{5}{16} \times \frac{4}{15} \times \frac{3}{14}$
- D. $\frac{5}{16} \times \frac{4}{16} \times \frac{3}{16}$

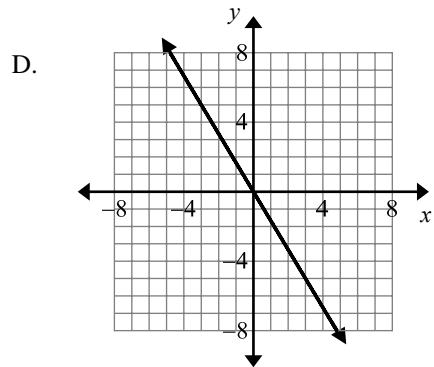
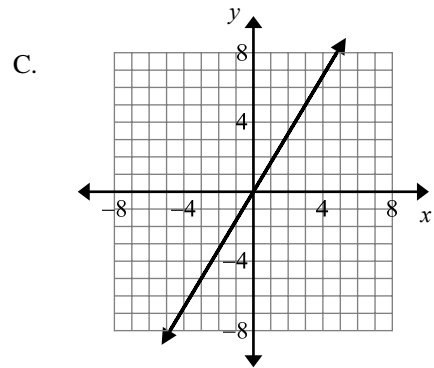
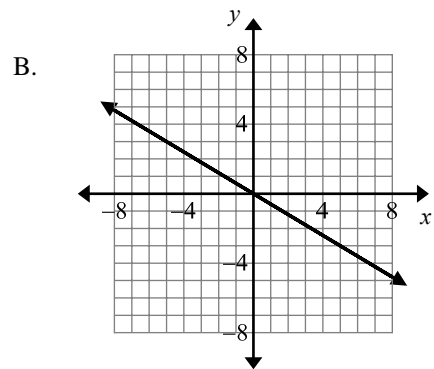
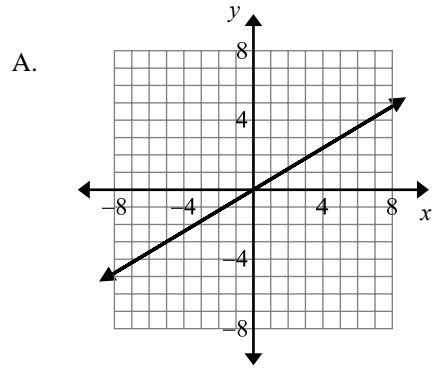
31. The bases and home plate of a baseball diamond form a 90-foot square. A diagram is shown below.



What is the shortest distance between First Base and Third Base?

- A. 90 ft
 - B. $90\sqrt{2}$ ft
 - C. $90\sqrt{3}$ ft
 - D. 180 ft
32. What is the sum of the polynomials $h^3 - h^2$ and $2h^3 + 5$?
- A. $3h^3 - h^2 + 5$
 - B. $h^3 + h^2 + 5$
 - C. $3h^3 - 6h^2$
 - D. $h^3 - 4h^2$

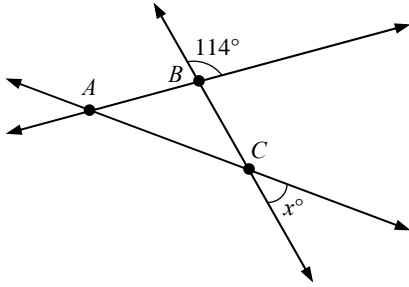
33. Which graph has a slope of $-\frac{5}{3}$?



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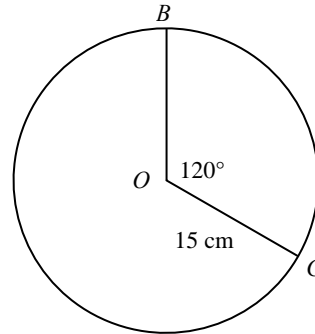
34. In the figure below, $\overline{AB} \cong \overline{BC}$.



What is the value of x ?

- A. 33°
 - B. 57°
 - C. 66°
 - D. 114°
35. In 2009, Jena got a driver's license, a work card, and a health card. A driver's license is valid for 4 years, a work card for 6 years, and a health card for 3 years. What is the next year that she will have to renew all three cards in the same year?
- A. 2015
 - B. 2021
 - C. 2022
 - D. 2033
36. A newspaper wants to know which of two candidates, Mr. Jones or Mrs. Smith, will win an upcoming election. The newspaper conducts a poll on its Internet website asking the question,
- "If the election were held today, for which candidate would you vote: Mr. Jones or Mrs. Smith?"
- Which of the reasons below is not a source of bias in this poll?
- A. The wording of the question favors Mr. Jones.
 - B. Some potential voters may not read the newspaper.
 - C. Some newspaper readers may not have Internet access.
 - D. Newspaper readers who are interested in the election are more likely to participate in the poll.

37. Use the figure below.



What is the length of \widehat{BC} ?

- A. 6π cm
 - B. 10π cm
 - C. 15π cm
 - D. 30π cm
38. The matrices below represent enrollment data for two schools and the electives each offers.

		School X			
		Music	Art	Tech	
Boys	[	483	216	512]
Girls	[	492	341	438]

		School Y			
		Music	Art	Tech	
Boys	[	387	267	501]
Girls	[	509	373	389]

How many girls are enrolled in art between Schools X and Y?

- A. 483
- B. 714
- C. 1001
- D. 1197

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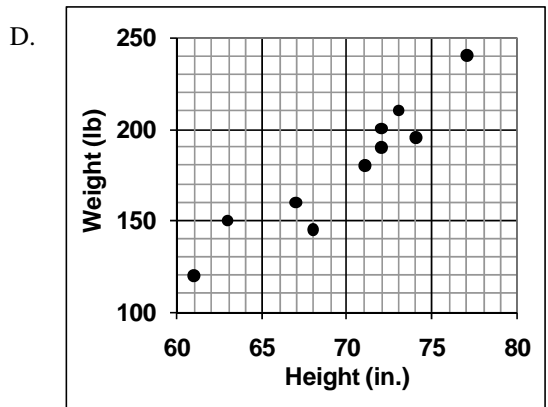
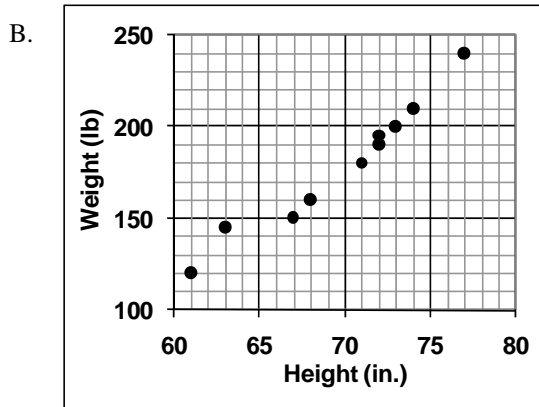
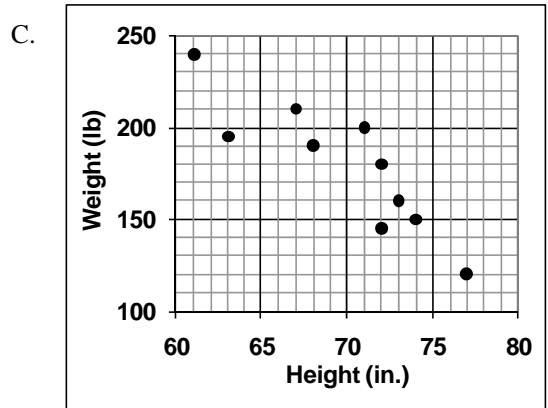
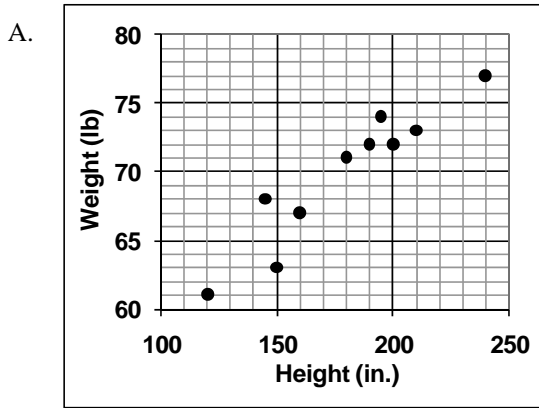
39. A student flips a fair coin and then rolls a fair six-sided die. What is the probability that the coin lands heads and the die shows a number greater than four?

- A. $\frac{1}{6}$
- B. $\frac{2}{5}$
- C. $\frac{1}{4}$
- D. $\frac{5}{6}$

40. The table below shows the heights and weights of the 10 players on a basketball team.

Height (in.)	61	63	67	68	71	72	72	73	74	77
Weight (lb)	120	150	160	145	180	200	190	210	195	240

What scatterplot shows the relationship between the players' heights and weights?



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Standards and Key by Question

Question	Key	1999 Standard	2006 Standard	Content / Application	Estimated DOK Level
1	C	1.12.1	1.12.6	C1 / A2	1
2	D	4.12.9	4.12.9	C3 / A3	2
3	D	3.12.3	3.12.2	C3 / A1	1
4	B	5.12.4	5.12.2	C4 / A2	2
5	A	2.8.1	2.12.1	C2 / A3	2
6	C	5.8.6	5.8.6	C4 / A3	2
7	A	2.8.6	2.12.4	C2 / A2	1
8	B	3.12.5	3.12.5	C3 / A3	1
9	D	5.8.2	5.12.5	C4 / A1	1
10	D	4.8.2	4.12.2	C3 / A2	2
11	C	2.12.4	2.12.3	C2 / A2	1
12	B	3.12.3	3.12.3	C3 / A3	2
13	D	5.12.5	5.12.3	C4 / A3	2
14	A	3.12.2	3.12.3	C3 / A2	1
15	B	2.8.6	2.8.2	C2 / A2	1
16	D	5.8.1	5.12.1	C4 / A3	2
17	C	1.8.7	1.8.6	C1 / A3	1
18	B	2.12.4	2.12.6	C2 / A3	1
19	C	4.12.1	4.12.1	C3 / A1	1
20	C	5.8.3	5.12.4	C4 / A2	1
21	D	4.12.5	4.12.5	C3 / A2	2
22	A	2.12.3	2.12.2	C2 / A2	1
23	B	5.12.4	5.12.5	C4 / A3	2
24	C	2.8.1	2.12.1	C2 / A3	1
25	C	3.12.3	3.12.2	C3 / A3	2
26	B	1.12.1	1.12.7	C1 / A2	1
27	A	2.12.3	2.12.2	C2 / A2	1
28	C	2.8.1	5.12.2	C4 / A1	1
29	A	3.12.5	3.12.5	C3 / A2	1
30	C	5.8.2	5.12.5	C4 / A2	1
31	B	4.12.7	4.12.7	C3 / A3	2
32	A	2.12.4	2.12.3	C2 / A2	1
33	D	4.12.5	4.12.5	C3 / A1	1
34	A	4.12.5	4.12.6	C3 / A3	2
35	B	1.12.3	1.12.8	C1 / A3	1
36	A	5.12.5	5.12.3	C4 / A3	2
37	B	4.12.1	4.12.1	C3 / A2	1
38	B	2.12.5	1.12.7	C2 / A1	1
39	A	5.8.2	5.12.5	C4 / A2	1
40	D	5.8.1	5.12.1	C4 / A2	2

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Standards and Key by Content/Application

Question	Key	1999 Standard*	2006 Standard*	Content / Application	Estimated DOK Level
1	C	1.12.1	1.12.6	C1 / A2	1
26	B	1.12.1	1.12.7	C1 / A2	1
17	C	1.8.7	1.8.6	C1 / A3	1
35	B	1.12.3	1.12.8	C1 / A3	1
38	B	2.12.5	1.12.7	C2 / A1	1
7	A	2.8.6	2.12.4	C2 / A2	1
11	C	2.12.4	2.12.3	C2 / A2	1
15	B	2.8.6	2.8.2	C2 / A2	1
22	A	2.12.3	2.12.2	C2 / A2	1
27	A	2.12.3	2.12.2	C2 / A2	1
32	A	2.12.4	2.12.3	C2 / A2	1
5	A	2.8.1	2.12.1	C2 / A3	2
18	B	2.12.4	2.12.6	C2 / A3	1
24	C	2.8.1	2.12.1	C2 / A3	1
3	D	3.12.3	3.12.2	C3 / A1	1
19	C	4.12.1	4.12.1	C3 / A1	1
33	D	4.12.5	4.12.5	C3 / A1	1
10	D	4.8.2	4.12.2	C3 / A2	2
14	A	3.12.2	3.12.3	C3 / A2	1
21	D	4.12.5	4.12.5	C3 / A2	2
29	A	3.12.5	3.12.5	C3 / A2	1
37	B	4.12.1	4.12.1	C3 / A2	1
2	D	4.12.9	4.12.9	C3 / A3	2
8	B	3.12.5	3.12.5	C3 / A3	1
12	B	3.12.3	3.12.3	C3 / A3	2
25	C	3.12.3	3.12.2	C3 / A3	2
31	B	4.12.7	4.12.7	C3 / A3	2
34	A	4.12.5	4.12.6	C3 / A3	2
9	D	5.8.2	5.12.5	C4 / A1	1
28	C	2.8.1	5.12.2	C4 / A1	1
4	B	5.12.4	5.12.2	C4 / A2	2
20	C	5.8.3	5.12.4	C4 / A2	1
30	C	5.8.2	5.12.5	C4 / A2	1
39	A	5.8.2	5.12.5	C4 / A2	1
40	D	5.8.1	5.12.1	C4 / A2	2
6	C	5.8.6	5.8.6	C4 / A3	2
13	D	5.12.5	5.12.3	C4 / A3	2
16	D	5.8.1	5.12.1	C4 / A3	2
23	B	5.12.4	5.12.5	C4 / A3	2
36	A	5.12.5	5.12.3	C4 / A3	2

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