

Practice Test Answer and Alignment Document

Mathematics: Grade 7

Pencil-and-Paper

The following pages include the answer keys for all machine-scored items. A sample student response for the top score is included for all hand-scored constructed response items.

- Some answer keys include one possible sample student response. Other valid methods for solving the problem can earn full credit unless a specific method is required by the item.
- In items where the scores are awarded for full and partial credit, the definition of partial credit will be confirmed during range-finding (reviewing sets of real student work).
- If students make a computation error, they can still earn points for reasoning or modeling.

Section 1

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|------------|--|
| 1. | A | 7.RP.A.2b |
| 2. | 51.2 | 7.NS.A.3 |
| 3. | A, D | 7.EE.A.2 |
| 4. | B | 7.RP.A.2d |
| 5. | 7 | 7.EE.B.4a-1 |
| 6. | A | 7.RP.A.2c |
| 7. | D | 7.NS.A.2c |
| 8. | C | 7.EE.A.1 |
| 9. | B, F | 7.NS.A.1c-2 |
| 10. | 3 | 7.RP.A.2b |
| 11. | -1 | 7.NS.A.1b-1 |
| 12. | B | 7.EE.B.4b |

Section 2

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|--|---|
| 1. | D | 7.EE.B.3 |
| 2. | 40 | 7.RP.A.1 |
| 3. | A | 7.R.2d 7.NS.A.2d |
| 4. | A, E | 7.M.1 7.EE.B.4a-1 7.EE.B.4a-2 7.M.1b |
| 5. | <p><u>Sample Top Score Response</u></p> <p>Pump p is the slowest. It pumps 40 gallons in 8 minutes, so the unit rate is 5 gallons per minute.</p> <p>Pump m is neither the fastest nor the slowest. It pumps 90 gallons in 9 minutes, so the unit rate is 10 gallons per minute.</p> <p>Pump k is the fastest. It pumps 90 gallons in 3 minutes, so the unit rate is 30 gallons per minute.</p> <p>Pump k is 6 times as fast as pump p, so it will take $\frac{1}{6}$ of 90 minutes, which is 15 minutes to fill the hot tub with water.</p> <p>Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.</p> | 7.R.1a 7.RP.A.1 7.RP.A.2b |
| 6. | A | 7.M.1 7.G.B.6 7.M.1b |
| 7. | D | 7.SP.C.5 |
| 8. | A, C | 7.G.A.3 |

Section 3

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|---|---|
| 1. | A, C, D | 7.RP.A.2a |
| 2. | D | 7.G.A.2 |
| 3. | <p>Note: <i>This sample top score response continues on the next page.</i></p> <p><u>Sample Top Score Response</u></p> <p>The current tank is represented by the L-shaped figure, formed by two connected rectangular prisms. The amount of water, in cubic feet, the current tank can hold is the combined volume of both prisms. The volume of the large rectangular prism is</p> $\left(2\frac{4}{5}\right)\left(4\frac{4}{5}\right)\left(2\frac{1}{2}\right) = \left(\frac{14}{5}\right)\left(\frac{24}{5}\right)\left(\frac{5}{2}\right) =$ $\left(\frac{14}{5}\right)\left(\frac{12}{1}\right)\left(\frac{1}{1}\right) = \frac{168}{5} = 33\frac{3}{5}.$ <p>The volume of the smaller rectangular prism is</p> $\left(2\frac{2}{5}\right)\left(2\frac{1}{2}\right)\left(5\frac{3}{5} - 2\frac{4}{5}\right) = \left(\frac{12}{5}\right)\left(\frac{5}{2}\right)\left(4\frac{8}{5} - 2\frac{4}{5}\right) =$ $6\left(2\frac{4}{5}\right) = 6\left(\frac{14}{5}\right) = \frac{84}{5} = 16\frac{4}{5}.$ <p>The current tank can hold</p> $33\frac{3}{5} + 16\frac{4}{5} = 49\frac{7}{5} = 50\frac{2}{5} \text{ cubic feet of water.}$ | <p>7.M.1 7.RP.A.3-2 7.G.B.6 7.M.1b 7.M.1c</p> |

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|---------------------|--|---|
| 3. <i>continued</i> | <p>For the new tank, each dimension of both rectangular prisms will be increased by 25% which can be represented by multiplying each current dimension by 1.25 or $\frac{5}{4}$ as follows:</p> <p>For the large rectangular prism,</p> $\left(\frac{14}{5} \times \frac{5}{4}\right)\left(\frac{24}{5} \times \frac{5}{4}\right)\left(\frac{5}{2} \times \frac{5}{4}\right) = \left(\frac{7}{2}\right)(6)\left(\frac{25}{8}\right) = 21\left(\frac{25}{8}\right) = \frac{525}{8} = 65\frac{5}{8}.$ <p>For the small rectangular prism,</p> $\left(\frac{12}{5} \times \frac{5}{4}\right)\left(\frac{5}{2} \times \frac{5}{4}\right)\left(\frac{14}{5} \times \frac{5}{4}\right) = 3\left(\frac{25}{8}\right)\left(\frac{7}{2}\right) = 32\frac{13}{16}.$ <p>The new tank will be able to hold</p> $65\frac{5}{8} + 32\frac{13}{16} = 65\frac{10}{16} + 32\frac{13}{16} = 97\frac{23}{16} = 98\frac{7}{16}$ <p>cubic feet of water.</p> <p>The percentage of increase from the amount of water contained in the current tank to the amount that will be contained in the new larger tank is $\left(98\frac{7}{16} - 50\frac{2}{5}\right) \div 50\frac{2}{5}$.</p> <p>Simplifying,</p> $\left(98.4375 - 50.4\right) \div 50.4 = 48.0376 \div 50.4 = 0.953125,$ <p>so the amount of water will increase by about 95%. The number of days it will take for the horses to drink water from the new tank is $4(1.95) = 7.8$ or approximately 8 days.</p> <p>Refer to the Holistic Rubric for 3-Point Modeling Constructed Response Items for score point information.</p> | <p>7.M.1 7.RP.A.3-2 7.G.B.6 7.M.1b 7.M.1c</p> |
| 4. | D | 7.R.2e 7.NS.A.3 |

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|--|--|
| 5. | <p><u>Sample Top Score Response</u></p> $3.5n + 4\left(5\frac{1}{4}n - 1.5\right) = 3.5n + 4\left(5\frac{1}{4}n\right) + 4(-1.5)$ $= 3.5n + 4\left(\frac{21}{4}n\right) - 6$ $= 3.5n + 4\left(\frac{21}{4}\right)n - 6$ $= 3.5n + 21n - 6$ $= 24.5n - 6$ $-21\left(\frac{2}{7} - \frac{7}{6}n\right) = (-21)\left(\frac{2}{7}\right) - 21\left(-\frac{7}{6}n\right)$ $= (-3)\left(\frac{2}{1}\right) + 21\left(\frac{7}{6}n\right)$ $= -6 + 21\left(\frac{7}{6}\right)n$ $= -6 + 7\left(\frac{7}{2}\right)n$ $= -6 + \frac{49}{2}n = -6 + 24\frac{1}{2}n$ <p>The two expressions are equivalent because $-6 + 24\frac{1}{2}n = 24\frac{1}{2}n - 6 = 24.5n - 6.$</p> <p>Refer to the Holistic Rubric for 3-Point Reasoning Constructed Response Items for score point information.</p> | 7.R.3a 7.EE.A.1 |
| 6. | B, E | 7.M.1 7.EE.B.4b 7.M.1b 7.M.1c 7.M.1d |
| 7. | C | 7.SP.B.3 |

Section 4

| Item Number | Answer Key | Evidence Statement Key/ Content Scope | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|--|--|----------------|-----|---|----|---|---|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|---|------------------------------|
| 1. | C | 7.G.B.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | B | 7.RP.A.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | Answers greater than or equal to 214 and less than or equal to 215 are correct | 7.M.1 7.EE.B.3 7.G.B.4-1 7.M.1c | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | B | 7.R.1c 7.RP.A.3-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | <p><u>Sample Top Score Response</u></p> <p>The 16 possible outcomes for this situation are represented in the table.</p> <table border="1" data-bbox="397 810 1118 1444"> <thead> <tr> <th>First Spinner</th> <th>Second Spinner</th> <th>Sum</th> </tr> </thead> <tbody> <tr><td>1</td><td>-1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>2</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>2</td><td>-1</td><td>1</td></tr> <tr><td>2</td><td>0</td><td>2</td></tr> <tr><td>2</td><td>1</td><td>3</td></tr> <tr><td>2</td><td>2</td><td>4</td></tr> <tr><td>3</td><td>-1</td><td>2</td></tr> <tr><td>3</td><td>0</td><td>3</td></tr> <tr><td>3</td><td>1</td><td>4</td></tr> <tr><td>3</td><td>2</td><td>5</td></tr> <tr><td>4</td><td>-1</td><td>3</td></tr> <tr><td>4</td><td>0</td><td>4</td></tr> <tr><td>4</td><td>1</td><td>5</td></tr> <tr><td>4</td><td>2</td><td>6</td></tr> </tbody> </table> <p>Player A needs to move at least 6 spaces to win the game. Of the 16 possible outcomes, 1 will result in a win. The probability that Player A will win is $\frac{1}{16}$.</p> <p>Player B needs to move at least 3 spaces to win the game. Of the 16 possible outcomes, 10 will result in a win. The probability that Player B will win is $\frac{10}{16}$ or $\frac{5}{8}$.</p> <p>Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.</p> | First Spinner | Second Spinner | Sum | 1 | -1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | -1 | 1 | 2 | 0 | 2 | 2 | 1 | 3 | 2 | 2 | 4 | 3 | -1 | 2 | 3 | 0 | 3 | 3 | 1 | 4 | 3 | 2 | 5 | 4 | -1 | 3 | 4 | 0 | 4 | 4 | 1 | 5 | 4 | 2 | 6 | 7.M.1 7.SP.C.7a 7.M.1c |
| First Spinner | Second Spinner | Sum | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | -1 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | -1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | -1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 2 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | -1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 2 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|------------|--|
| 6. | B | 7.R.3b 7.EE.B.4a-2 |
| 7. | D | 7.SP.A.2 |
| 8. | 100 | 7.RP.A.3-1 |