Instructional Materials for WCSD Math Common Finals

The Instructional Materials are for student and teacher use and are aligned to the 2018-2019 Course Guides for the following courses:

High School
- #7824 Algebra 1 Year 1 Semester 1

When used as test practice, success on the Instructional Materials does not guarantee success on the district math common final or the Nevada End of Course final.

Students may use these Instructional Materials to become familiar with the format and language used on the district common finals. Similar items may also appear on the state provided Nevada End of Course final administered at the end of year 2 semester 2 of this course. Familiarity with standards and vocabulary as well as interaction with the types of problems included in the Instructional Materials may result in less anxiety on the part of the students. The length of the actual final exam may differ in length from the Instructional Materials.

Teachers can use the Instructional Materials in conjunction with the course guides to ensure that instruction and content is aligned with what will be assessed on the end of semester/end of course final. The Instructional Materials are not representative of the depth or full range of learning that should occur in the classroom.

*Students will be allowed to use a non-programmable scientific calculator on Algebra 1 Year 1 Semester 1 and Algebra 1 Year 1 Semester 2 final exams.*
Algebra 1 Reference Sheet

Note: You may use these formulas throughout this entire test.

**Linear**

Slope \( m = \frac{y_2 - y_1}{x_2 - x_1} \)

Midpoint \( M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \)

Distance \( d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \)

Slope-Intercept Form \( y = mx + b \)

**Quadratic**

Vertex-Form \( y = a(x - h)^2 + k \)

Standard Form \( y = ax^2 + bx + c \)

Intercept Form \( y = a(x - p)(x - q) \)

**Exponential**

(h, k) Form \( y = ab^{x-h} + k \)

**Probability**

\( P(A \text{ and } B) = P(A) \cdot P(B) \)

\( P(A \text{ and } B) = P(A) \cdot P(B|A) \)

\( P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B) \)

**Volume and Surface Area**

\( V = \pi r^2 h \)

\( SA = 2(\pi r^2) + h(2\pi r) \)

\( V = \frac{1}{3} \pi r^2 h \)

\( SA = \pi r^2 + \frac{1}{2} (2\pi r \cdot l) \)

\( V = \frac{1}{3} Bh \)

\( SA = B + \frac{1}{2} (Pl) \)

Where \( B = \text{base area} \) and \( P = \text{base perimeter} \)
1. Jayden added \( \frac{6}{7} + x \) and the result was an irrational number. Which statement about \( x \) must be true?

A. \( x \) must be a rational number  
B. \( x \) must be an irrational number  
C. \( x \) must be a natural number  
D. \( x \) must be an integer

2. Which of the following could be the first step in solving \( \frac{1}{2} (x + 3) = \frac{2}{3} \)? Select all that apply.

F. Distribute \( \frac{1}{2} \) to \((x + 3)\) on the left side of the equation  
G. Subtract 3 from both sides of the equation  
H. Multiply by the reciprocal of \( \frac{1}{2} \) on both sides of the equation  
I. Divide by \( \frac{1}{2} \) on both sides of the equation  
J. Distribute \( \frac{2}{3} \) to \( \frac{1}{2} (x + 3) \) on the left side of the equation

3. A chemistry teacher needs 25 liters of a 12% salt solution. The teacher has a mixture of a 5% salt solution and a mixture of a 20% salt solution. How many liters of the 5% and 20% mixtures should she mix to get what she needs? Round your answer to the nearest tenth if necessary.

A. 1 liter of the 5% mixture and 24 liters of the 20% mixture  
B. 8 liters of the 5% mixture and 17 liters of the 20% mixture  
C. 12.5 liters of the 5% mixture and 12.5 liters of the 20% mixture  
D. 13.3 liters of the 5% mixture and 11.7 liters of the 20% mixture
4. Which properties can be used to transform the equation \( \frac{1}{2}(4x - 8) = 10 + 7x \) into the equivalent equation \( 2x - 4 = 7x + 10 \)?

A. Division Property and Commutative Property of Addition  
B. Distributive Property and Addition Property of Equality  
C. Multiplication Property of Equality and Addition Property of Equality  
D. Distributive Property and Commutative Property of Addition

5. Solve the equation \( 34.8x + 0.2(x - 4) = -16.8 + 27x \). Bubble your answer in the grid provided below.

6. What is the solution for \( x \) in \( 5x - 2 + 2x = 7x - 2 \)?

A. \( x = 0 \)  
B. \( x = 1 \)  
C. no solution  
D. infinitely many solutions

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7. In the equation, \( m = \frac{y_2 - y_1}{x_2 - x_1} \) solve for \( y_2 \).

   A. \( y_2 = m(x_2 - x_1) + y_1 \)
   
   B. \( y_2 = -\frac{y_1}{m(x_2 - x_1)} \)

   C. \( y_2 = \frac{m}{x_2 - x_1} + y_1 \)

   D. \( y_2 = mx_2 + \frac{y_1}{x_1} \)

8. Which of the following inequalities represents the solution to \( 3a + 3 - 6a > 15 \)?

   A. \( a < -6 \)
   
   B. \( a > 4 \)

   C. \( a < -4 \)

   D. \( a > -4 \)

9. The soccer club president is planning to order shirts for each of the club’s 15 members. It will cost $45 for the design to be created and an additional cost for each shirt. The cost of each shirt varies depending on the type of shirt chosen with the prices shown below. The club president must order the same type of shirt for all of the members and cannot spend more than $135. Based on this information, which type(s) of shirts can the club president choose to purchase?

<table>
<thead>
<tr>
<th>Type</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank Top</td>
<td>$3 each</td>
</tr>
<tr>
<td>Short Sleeve</td>
<td>$4 each</td>
</tr>
<tr>
<td>Long Sleeve</td>
<td>$6 each</td>
</tr>
<tr>
<td>Sweatshirt</td>
<td>$9 each</td>
</tr>
</tbody>
</table>

   A. Sweatshirt

   B. Long Sleeve

   C. Sweatshirt, Long Sleeve, Short Sleeve or Tank Top

   D. Long Sleeve, Short Sleeve or Tank Top

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10. Which of the following represents the solution to the compound inequality, 
   \( 2x + 5 < 1 \) or \( 4x - 7 \geq 9 \)?

   A.  
   
   B.  
   
   C.  
   
   D.  

11. Which of the following is the solution for \( x \) in the equation \(-2|x + 3| + 6 = 10\)?

   A.  no solution  
   B.  \( x = -5, x = -1 \)  
   C.  \( x = 1 \)  
   D.  \( x = -5 \)

12. Which of the following is the solution for \( x \) in the equation \(-3|x + 4| = -6\)?

   A.  \( x = -2 \)  
   B.  \( x = -6 \) and \( x = -2 \)  
   C.  \( x = -2 \) and \( x = 6 \)  
   D.  no solution
13. A line graphed on the coordinate plane has a slope of 2 and contains the point (3, 1). Which of the following points is on the same line?
   
   A. (−3, −5)  
   B. (−3, −2)  
   C. (0, −5)  
   D. (−5, 0)

14. What is the equation of the line graphed below?

   A. \( y = -\frac{1}{3}x + \frac{16}{3} \)  
   B. \( y = -\frac{1}{3}x + \frac{8}{3} \)  
   C. \( y = -3x - 8 \)  
   D. \( y = -3x + 16 \)
15. The graph below shows the account balance of a student’s lunch money account.

Which of the following statements are true? Select all that apply.

F. Each lunch costs $4.

G. Each lunch costs $5.

H. The account started with a balance of $40.

I. The student won’t have any money left in the account after eating 8 lunches.

J. The student has enough money in the account to pay for 40 lunches.

16. Which equation of the line passes through the points \( \left( \frac{3}{2}, 5 \right) \) and \( \left( -\frac{1}{2}, 8 \right) \)?

A. \( y = \frac{3}{2} \left( x + \frac{1}{2} \right) + 8 \)

B. \( y = \frac{3}{2} \left( x + \frac{3}{2} \right) + 5 \)

C. \( y = -\frac{3}{2} \left( x - \frac{1}{2} \right) + 8 \)

D. \( y = -\frac{3}{2} \left( x - \frac{3}{2} \right) + 5 \)
17. Which of the following equations has a slope of \(\frac{1}{2}\) and goes through the point \((-6, 2)\)?
Select all that apply

F. \(y - 6 = \frac{1}{2}(x - 2)\)

G. \(y - 2 = \frac{1}{2}(x + 6)\)

H. \(x + 2y = 5\)

I. \(y = \frac{1}{2}x + 5\)

J. \(x - 2y = -10\)

K. \(y = \frac{1}{2}x + 2\)

18. What are the coordinates of the \(x\)-intercept of the equation \(6x - 3y = 24\) ?

A. \((0, -8)\)  
B. \((0, 4)\)

C. \((-8, 0)\)  
D. \((4, 0)\)

19. A teacher has $75 to spend on paint sets and marker sets. Paint sets cost $3.75 each and marker sets cost $1.25 each. What is the greatest number of marker sets the teacher can purchase?

A. 60 sets  
B. 30 sets

C. 20 sets  
D. 15 sets
20. Given the graph and the equation, which line has a larger slope?

<table>
<thead>
<tr>
<th>Line A</th>
<th>Line B</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Graph" /></td>
<td>$3x - y = 12$</td>
</tr>
</tbody>
</table>

A. Line A has a larger value for slope  
B. Line B has a larger value for slope  
C. Line A and Line B have the same slope  
D. Cannot be determined

21. A linear function passes through the points $(10, 5)$ and $(-15, -5)$. A second function is represented by the equation $4x - 3y = 6$. What is the $y$-intercept of the function with the greater rate of change?

A. $-20$  
B. $\frac{3}{2}$  
C. $-2$  
D. $1$
22. Line \( w \) and line \( v \) are perpendicular to each other. Line \( w \) passes through the points \((-4, 8)\) and \((12, -2)\). What is the slope of line \( v \)? Bubble your answer in the grid provided below.

![Grid](image)

23. Which line is parallel to the graph of \(4x + 8y = 32\) ?

A. \( y = -\frac{1}{2}x \)  
B. \( y = 8 \)  
C. \( y + 1 = 2(x - 6) \)  
D. \( y + 5 = -\frac{1}{8}(x + 2) \)

24. Which of the following represents a function?

<table>
<thead>
<tr>
<th>I. domain</th>
<th>range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
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<tr>
<td>4</td>
<td>5</td>
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<td>5</td>
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<table>
<thead>
<tr>
<th>II. domain</th>
<th>range</th>
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<tbody>
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<tr>
<td>3</td>
<td>6</td>
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<tr>
<td>5</td>
<td>10</td>
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<table>
<thead>
<tr>
<th>III. domain</th>
<th>range</th>
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<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

A. All of the above  
B. I and II  
C. I and III  
D. II and III

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25. Which graph does not represent a function?

A.  

B.  

C.  

D.  

26. Kaj needs to build 15 birdhouses for a class project. It takes 20 minutes to build each birdhouse. The number of minutes it takes Kaj to build birdhouses is a function of the number of birdhouses she builds. Which statement correctly describes the domain or range of this function?

A. The domain is the set of all real numbers.

B. The domain is the set of all integers from 0 to 15.

C. The range is the set of all real numbers.

D. The range is the set of all integers 0 to 300.

27. If \( h(x) = -\frac{1}{2}x + 3 \), find \( h(-29) \).

A. \( \frac{35}{2} \)  
B. \( \frac{32}{3} \)  
C. 64  
D. \( \frac{29}{2}x - 87 \)
28. The point \((-12, n)\) is an ordered pair of the function \(f(x) = 3x - 9\). What is the value of \(n\)?

A. \(n = -1\)  
B. \(n = -7\)  
C. \(n = -45\)  
D. \(n = -63\)

29. A cell phone company charges a monthly fee of $45 for a single phone line and $15 for every gigabyte (GB) of data used per month. Write a function that models the total monthly cost of the cell phone line.

A. \(f(x) = 30x\)  
B. \(f(x) = 60x\)  
C. \(f(x) = 15 + 45x\)  
D. \(f(x) = 45 + 15x\)

30. The graph below represents the amount of profit (in dollars) a company expects to make from selling bracelets. According to this model, how much money would the company make if they sell 400 bracelets? Round your answer to the nearest dollar if necessary.

A. $994  
B. $400  
C. $162  
D. $154
31. An apple orchard allows people to come and pick their own apples. Customers pay $5 for a basket and $0.10 for each apple. The function \( f(x) = 0.10x + 5 \) gives the cost for \( x \) apples picked. What is the range of the function?

A. \{all real numbers\}  
B. \{0, 1, 2, 3, 4, 5 \ldots\}  
C. \{0, 0.10, 0.20, 0.30, 0.40, 0.50 \ldots\}  
D. \{5, 5.10, 5.20, 5.30, 5.40, 5.50 \ldots\}  

32. Given the graph of \( f(x) \) and \( g(x) \) below, describe how the graph of \( f(x) \) is transformed to produce the graph of \( g(x) \).

A. \( f(x) \) is translated left 6 units  
B. \( f(x) \) is translated left 3 units  
C. \( f(x) \) is translated up 6 units  
D. \( f(x) \) is translated up 3 units  

33. A student graphed the line \( 6x + y = 8 \). If she substitutes the number 3 in for the number 8 in the equation, how will the graph of the line change?

A. The graph of the line will shift up five.  
B. The graph of the line will shift down five.  
C. The graph of the line will rise less steeply.  
D. The graph of the line will rise more steeply.
<table>
<thead>
<tr>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. A</td>
<td>19. A</td>
<td>30. A</td>
</tr>
<tr>
<td>10. C</td>
<td>22. ( \frac{8}{5} )</td>
<td>33. B</td>
</tr>
<tr>
<td>11. A</td>
<td>23. A</td>
<td></td>
</tr>
<tr>
<td>12. B</td>
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