DIRECTIONS: Show all work in the space provided.

1. Joniqua wants to get an A in her Algebra 1 class. So far she has four test scores; 77%, 83%, 97%, and 95%. Which choice best represents what Joniqua’s minimum score must be on the fifth test to have an overall average of 90% so she can receive an A in the class?

   A. 100 percent  
   B. 98 percent  
   C. 96 percent  
   D. 90 percent

2. Trevor works at Checkers. He notices that his customers ordered 6 burgers for every 5 chicken sandwiches. Express the ratio of burgers to chicken sandwiches as a fraction.

   

3. Simplify the following algebraic ratio (Simplify Completely):

\[
\frac{4xyz^2}{6y}
\]

Simplified ratio ______________

4. Simplify the following algebraic ratio (Simplify Completely):

\[
\frac{2a - 4}{-3a + 6}
\]
5. Brian is solving an equation \( x^2 + 7 = 16 \), his solution set is \( \{-3, 3\} \). Some of his classmates did not have \( x = -3 \) as one of the solutions. Explain why Brian’s solution is correct.

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6. Your mother sent you to the store for baked beans. If you can buy one can of baked beans for $4.79 then how many cans of baked beans can you buy with $18?

7. Solve the following equation for \( y \):

\[
\frac{11}{27} = \frac{y}{243}
\]

A. 99  
B. 97.2  
C. 22  
D. 9
Use the following for problems 8 – 9.

Tiffany, a scuba diver has to be able to solve the following problems in order to be able to go on a diving with her father:

A scuba diver’s position in the water changes at a rate of 3 meters every 10 seconds. One full tank of air has enough air for a 30 minute dive.

8. If Tiffany has a full tank of air and has been underwater for 3 minutes, how many meters has she traveled? (Assume that she has been constantly in motion.)

9. Tiffany has only a full tank of air and has covered a distance of 450 meters. She believes that she can stay beneath the water swimming for an additional 15 minutes. Determine if Tiffany’s is correct.

   Explain. (Express your answer in minutes.)

10. Jennifer borrowed her mother’s car and needs to fill the tank up with gas before returning it, however she only has a ten dollar bill.

   How many gallons of gas can Jennifer buy if gas is currently selling for $3.38 per gallon?

   (Round to the nearest hundredth gallon):
11. Solve the following equation for $x$:

$$\frac{14}{x} = \frac{70}{x + 8}$$

12. Tamara is shopping at a farmer’s market for the local Chili Cook-Off Contest. If 3 pounds of hot peppers costs $1.92, how much will 7 pounds cost?

A. $13.44
B. $ 4.48
C. $ 4.20
D. $ 4.02

13. It takes about 23 minutes to grade a student’s paper. How long, in hours and minutes, does it take to grade papers for a class of 27 people?

A. 621 hours
B. 10 hours 35 mins
C. 10 hours 21 mins
D. 6 hours 21 mins

14. Maritza traveled by car 415 kilometers in 212 minutes, what was the average speed in miles per hour (mph) that she traveled?

(Round to the nearest tenth):
15. Victor ran a distance of 3.8 kilometers (km) in 55 minutes (min). Calculate his speed in km/min.

(Round to the nearest hundredth):

A. 209.00 km/min
B. 0.70 km/min
C. 0.07 km/min
D. 0.06 km/min

16. Does multiplying by a conversion factor change the amount of what is being measured? Explain.

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__________________________________________________________________
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17. Darrell bought 50 blank DVD's for $32. How much did he pay for each DVD?

(Round to the nearest cent):
**Use the following for problems 18 – 19.**

Jill, a produce department manager of a local grocery store, wants to share information regarding the number of apples that can be packaged into their brown paper bags with her employees. She uses \( a \) to represent the number of apples and \( b \) to represent the number of bags.

18. Given \( a \) is proportional to \( b \). If \( a = 16 \) when \( b = 4 \), then write the equation for the relation between \( a \), apples, and \( b \), bags.

\[
\text{A. } a = 16b \\
\text{B. } a = 12b \\
\text{C. } a = 4b \\
\text{D. } a = \frac{b}{4}
\]

19. If all the bags from problem #18 are replaced with new bags that hold more apples per bag, would the formula change? Explain.

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20. Given \( s \) is proportional to \( t \). If \( s = 4 \) when \( t = 16 \). Find the value of \( s \) when \( t = 30 \).

\[
\text{A. } s = 30 \\
\text{B. } s = 15 \\
\text{C. } s = 7.5 \\
\text{D. } s = 4
\]
**Use the following for problem 21.**

An average typist can type with accuracy from 30 – 50 *words per minute*. A good typist can type with accuracy greater than 60 *words per minute*.

21. If Sylvia can type 140 *words* in 210 *seconds*, then is she an average typist or a good typist? Explain. (Express your answer in *words per minute*.)

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

22. Solve for \( r \):

\[ \frac{r + 2}{35} = \frac{30}{50} \]

\( r = \) ____________

23. Simplify Completely:

\[ \frac{16i - 12i}{8i - 6i} \]

Simplified: ____________

24. Simplify Completely:

\[ \frac{ab^2c^2}{abcde} \]

Simplified: ____________
## ANSWER KEY

<table>
<thead>
<tr>
<th>Solution</th>
<th>NGSSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. B. 98 percent</td>
<td>MA.912.A.10.1</td>
</tr>
<tr>
<td>2. 6 / 5</td>
<td>MA.912.A.5.1</td>
</tr>
<tr>
<td>3. Simplified ratio: $\frac{2xz^2}{3}$</td>
<td>MA.912.A.5.1</td>
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<td>4. -2 / 3</td>
<td>MA.912.A.5.1</td>
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<tr>
<td>5. Answers may vary. One possible explanation: $x^2 + 7 = 16$, $x^2 = 9$, $x = \pm 3$. The other students did not include the negative solution.</td>
<td>MA.912.A.10.2</td>
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<tr>
<td>6. 3</td>
<td>MA.912.A.10.2</td>
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<tr>
<td>7. A. 99</td>
<td>MA.912.A.5.4</td>
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<tr>
<td>8. 54</td>
<td>MA.912.A.10.2</td>
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<tr>
<td>9. No. Answers may vary. One possible explanation is that Tiffany should not stay under water swimming much longer because she has used 25 minutes of her full tank of air. She only has an additional 5 minutes left since a full tank of air has only enough air for a 30 minute dive.</td>
<td>MA.912.A.10.2</td>
</tr>
<tr>
<td>10. 2 . 9 6</td>
<td>MA.912.A.10.1</td>
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<tr>
<td>11. 2</td>
<td>MA.912.A.5.4</td>
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<tr>
<td>12. B. $4.48$</td>
<td>MA.912.A.10.2</td>
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<tr>
<td>13. C. 10 hours 21 mins</td>
<td>MA.912.A.10.2</td>
</tr>
<tr>
<td>14. 7 2 . 8</td>
<td>MA.912.A.10.1</td>
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<tr>
<td>15. C. 0.07 km / min</td>
<td>MA.912.A.5.1</td>
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### Topic III: Proportional Reasoning

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>16.</strong></td>
<td>Answers may vary. One possible explanation is: Multiplying by a conversion factor does not change the amount that is being measured because the conversion factor is equivalent to 1.</td>
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<tr>
<td><strong>17.</strong></td>
<td>0.64</td>
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<td><strong>18.</strong></td>
<td>C. ( a = 4b )</td>
</tr>
<tr>
<td><strong>19.</strong></td>
<td>Answers may vary: One possible explanation is the equation would have a proportion solved for ( a ) with a larger coefficient for ( b ) depending on how many apples the bag could hold (i.e. ( a = 5b ) or any equation with a coefficient greater than 4 on the right side of the equation).</td>
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<td><strong>20.</strong></td>
<td>C. ( s = 7.5 )</td>
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<tr>
<td><strong>21.</strong></td>
<td>Answers may vary: One possible explanation is that Silvia is an average typist because she can type an average of 40 words per minute. One possible way to solve this is to rewrite 1 minute as 60 seconds, then enter it into a ratio table:</td>
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<tr>
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<tr>
<td><strong>Words</strong></td>
<td><strong>140</strong></td>
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<tr>
<td><strong>Seconds</strong></td>
<td><strong>60</strong></td>
</tr>
<tr>
<td>Set up a proportion, then solve for ( w ).</td>
<td></td>
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<tr>
<td>( \frac{w}{60} = \frac{140}{210} ); ( w = 40 )</td>
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<tr>
<td><strong>22.</strong></td>
<td>( r = 19 )</td>
</tr>
<tr>
<td><strong>23.</strong></td>
<td>Simplified: 2</td>
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<tr>
<td><strong>24.</strong></td>
<td>Simplified: ( \frac{bc}{de} )</td>
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</tbody>
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