Direct and Inverse Variation Test

Answer the following multiple choice questions on the scantron sheet provided. (3 points each)

1. 1 mile =
   A. 5820 feet
   B. 5280 feet
   C. 2850 feet
   D. 2580 feet

2. 1 quart =
   A. 8 cups
   B. 2 cups
   C. 4 cups
   D. 16 cups

3. 1 kilometer =
   A. 0.0001 meters (one one thousandth of a meter)
   B. 0.01 meters (one one hundredth of a meter)
   C. 100 meters (one hundred meters)
   D. 1000 meters (one thousand meters)

4. 1 yard =
   A. 6 feet
   B. 12 feet
   C. 3 feet
   D. 4 feet

5. 1 mile =
   A. 1.6 kilometers
   B. 0.6 kilometers
   C. 16 kilometers
   D. 6 kilometers

6. \[
\frac{18}{21} = \frac{19}{d}
\]
   A. d = 22.16
   B. d = 22.17
   C. d = 2.27
   D. d = 2.26
7. \[
\frac{13}{b} = \frac{8}{1}
\]
   A. \( b = 1.25 \)
   B. \( b = 1.26 \)
   C. \( b = 16.25 \)
   D. \( b = 1.625 \)

8. Classify the following graph as...
   A. Direct
   B. Inverse
   C. Neither

9. Classify the following graph as...
   A. Direct
   B. Inverse
   C. Neither

10. Classify the following graph as...
    A. Direct
    B. Inverse
    C. Neither

11. Classify the following graph as...
    A. Direct
    B. Inverse
    C. Neither
12. Does this equation $y = 0.5x$ represent a direct or inverse variation?
   A. Direct
   B. Inverse

13. Does this equation $y = \frac{87.2}{x}$ represent a direct or inverse variation?
   A. Direct
   B. Inverse

14. Does this equation $y = kx$ represent a direct or inverse variation?
   A. Direct
   B. Inverse

15. Does this equation $\frac{y}{x} = 1.6$ represent a direct or inverse variation?
   A. Direct
   B. Inverse

16. Does this equation $xy = 72$ represent a direct or inverse variation?
   A. Direct
   B. Inverse

17. Does this table represent a direct or inverse variation?
   A. Direct
   B. Inverse

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48</td>
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<tr>
<td>2</td>
<td>24</td>
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<td>3</td>
<td>16</td>
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<td>4</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>9.6</td>
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<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>6.8</td>
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<tr>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>5.3</td>
</tr>
</tbody>
</table>
18. For the table in Question 17, which of the following rules is correct?
   A. 48x=y
   B. 48/x=y
   C. x/y=24
   D. 24y=x
   E. None of these work

19. Does this table represent a direct or inverse variation?
   A. Direct
   B. Inverse

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>32</td>
</tr>
<tr>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

20. For the table in Question 19, which of the following rules is correct?
   A. x/y = 2
   B. xy = 2
   C. y/x=2
   D. 2y=x
   E. None of these work

21. The amount of time it takes mail carriers to deliver the mail in one town is inversely proportional to the number of mail carriers delivering the mail. With 8 mail carriers, it takes 6 hours to deliver the town’s mail. What is the number of hours it would take 4 mail carriers to deliver the town’s mail?
   A. 2
   B. 3
   C. 10
   D. 12
22. A model of a skyscraper is 15 inches tall. The model uses the scale shown below.

<table>
<thead>
<tr>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 inch : 12 yards</td>
</tr>
</tbody>
</table>

Which of the following proportions can be used to find \( x \), the height in yards of the actual skyscraper?

A. \[ \frac{15}{12} = \frac{0.5}{x} \]

B. \[ \frac{15}{x} = \frac{0.5}{12} \]

C. \[ \frac{0.5}{15} = \frac{x}{12} \]

D. \[ \frac{0.5}{12} = \frac{x}{15} \]

Solve each problem with a logical answer. SHOW ALL WORK. State you answer in a complete sentence. (5 points each)

23. In Japan, 1 dollar is worth 80.2600 Yen. How many Yen can you get with $50?

24. A recipe says to cook a casserole the oven should be set at 400 degrees for 30 minutes. If instead you put it at 350 degrees, how much time will it cook for?

25. The time it takes to fly from Los Angeles to New York varies with the speed of the plane. If the trip takes 6 hours at 900 km/h, how long would it take at 800 km/h?

26. The number of kilograms of water in a person’s body is proportional to a person’s mass. A person with a mass of 90 kg contains 60 kg of water. How many kilograms of water are in a person with a mass of 50 kg?
1. The numbers of games won and lost by six local baseball teams are shown in the double bar graph below.

![Double Bar Graph]

a. How many more games did the Hawks win than the Wolves won? Show or explain how you got your answer. (3 points)
b. For the Panthers, what is the ratio of games won to games played? Show or explain how you got your answer. (3 points)
c. Which of the six teams has the greatest ratio of games won to games played? Show or explain how you got your answer. (4 points)

The Scorpions later played additional games that were not included in the double bar graph. The additional games changed the Scorpions’ ratio of games won to games played to 1/2.

d. What is the least number of additional games the Scorpions could have played? Show or explain how you got your answer. (4 points)

30. Heart rates and life spans of most mammals are inversely related. A cat lives for about 15.2 years on average and has a heart rate of 126 beats per minute.

a. A hamster has a heart rate of about 634 beats per minute. About how long will a hamster live? (4 points)
b. An elephant lives for about 70 years. About how many times per minute does an elephant’s heart beat? (4 points)
c. What is the constant of variation in this problem? Solve numerically. (3 points)