Decide whether or not the set is closed under addition.

1) \{1, 3, 5, 7, ...\}
   A) Not closed  B) Closed  

2) \{0, 1\}
   A) Closed  B) Not closed

3) \{n \in \mathbb{N}: n \leq 28\}
   A) Closed  B) Not closed

Decide which property of addition is illustrated.

4) \((2 + 9) + 9 = (9 + 2) + 9\)

5) \((7 + 4) + 8 = 7 + (4 + 8)\)

Rewrite the subtraction problem as an equivalent addition problem.

6) \(x - 57 = 81\)

7) \(79 - x = 55\)

Complete the puzzle as instructed.

8) Make the following a magic square.

\[
\begin{array}{ccc}
97 & 96 & 110 \\
0 & 101 & 0 \\
105 & 0 & 0 \\
\end{array}
\]

Find, if possible, the whole number that makes the equation true.

9) \((4 + 8) \cdot \square = 4 \cdot \square + \square \cdot 8\)
   A) Any whole number  B) No whole number
   C) 0  D) 4

10) \(\square \div 6 = 0\)
   A) 6  B) 0
   C) No whole number  D) 1

Decide whether or not the set is closed under multiplication.

11) \{1, 2, 3, 4, ...\}
    11) Closed

12) \{1, 2, 3, ..., 45\}
    12) Not Closed
Remove or add parentheses as indicated.
13) Rewrite \((x + y + z)(x - y)\) without parentheses.
   \((x^2 - y^2 + zx - yz)\)

Use the distributive property to factor the following.
14) \(x^2y + xy^2\)  \(14\) \(xy(x + y)\)

Rewrite the problem as a multiplication problem.
15) \(42 ÷ 7 = x\)  \(15\) \(7 \cdot x = 42\)
16) \(n ÷ m = p\)  \(16\) \(m \cdot p = n\)

Solve the problem.
17) Mary had 7 strings of beads, each having 128 beads. She restrung them such that she had 4 strings, each having the same number of beads again. How many beads did she have on each string?
   17) 226

18) The height of the tower is 8 times the height of the building next to it. If the tower is 32,000 ft tall, then what is the height of the building? (4000 ft)

Find or investigate the function as requested.
19) The set of ordered pairs is a function. Find a rule that could describe the function.
   \{ (4, 12), (5, 15), (7, 21), (9, 27) \}
   19) \(y = 3x\)

Determine if the following is a function or not.
20) The set of ordered pairs \{(2, 7), (6, 11), (6, 12), (8, 13)\} in the set of whole numbers.
   20) No
21) The set of ordered pairs \{(14, 19), (18, 23), (19, 24), (20, 29)\} in the set of whole numbers.
   21) Yes

Solve the problem.
22) A house was purchased for $85,000. After 7 years the value of the house was $113,000. Express the house's value \(V(t)\) in terms of time \(t\) in years. \((v(t) = 85000 + 4000x)\)
22)

23) A moving firm charges a flat fee of $40 plus $35 per hour. Find the cost \(C(x)\) of using the moving firm for \(x\) hours.
   \((C(x) = 40 + 35x)\)
23)
24) The speed $V(t)$ of a particle is given by $14t - 3t^2$. Calculate $V(0)$, $V(1)$, $V(2)$, $V(3)$, and $V(4)$. Graph the function using these points.

25) Crafty Bill's Cool Car Sales opened as a used car sales lot in 1991. The graph shows the number of cars sold as a function of time. What is the approximate number of cars sold in 1993? (about 850 cars)

Find the missing numbers.

26)

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>6</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>(d)</td>
<td></td>
</tr>
</tbody>
</table>

26) $a = 9, b = 1$  
$c = 0, d = 5.$

Solve the problem.

27) Jamie is planning to start her own business. She has saved $1100 for this purpose. She estimates a cost of $880 for materials and $480 for advertising. By how much money is she falling short?

27) $260$

Perform the indicated operation.

28) $56_{eight} + 32_{eight}$

29) $111_{two} - 11_{two}$

30) $3\text{ hr } 42\text{ min } 18\text{ sec}$

30) $3\text{ hr } 41\text{ min } 44\text{ sec}$
Fill in the missing numbers.
31) \[ \frac{34}{\times \ a} \]
\[ \frac{204}{\phantom{1}6} \]
32) \[ \frac{22}{\phantom{1}176 \div 16} \]
\[ \frac{16}{-16} \]
\[ \frac{0}{\phantom{1}8} \]

Multiply using the method indicated.
33) \[ 308 \times 58; \text{ conventional algorithm} \]
\[ 17,864 \]

Simplify the following. Leave answer as a power.
34) \[ 70^{92} \cdot 70^{44} \cdot 70^9 \]
\[ (70^{145}) \]

Perform the following division.
35) \[ 21 \overline{)168} \]
\[ 8 \]
36) \[ 109 \overline{)2740} \]
\[ 25R15 \]

Identify the base used in the computation.
37) \[ \frac{414}{+ 333} \]
\[ 1302 \]
A) Base three
B) Base five
C) Base six
D) Base four

Estimate the following mentally.
38) \[ 90 + 246 + 254 + 110 \]
\[ 700 \]

Use the method suggested to compute mentally.
39) Use breaking and bridging.
\[ \frac{86}{+ 69} \]
\[ 155 \]
40) Use trading off.
\[ \frac{121}{+ 42} \]
\[ 163 \]
41) Use front-end multiplying.
\[ \frac{13}{\times 47} \]
\[ 415 \]

Round the number to the place value indicated.
42) \[ 80,144 \]
\[ 80,000 \]
43) \[ 836 \]
\[ 800 \]

Estimate by rounding.
44) \[ \frac{94}{- 75} \]
\[ 20 \]