Extra Problems

13) a) OK

1) 3 8 1 ARE OTHER SOLUTIONS POSSIBLE?
    2 4 6
    7 0 5 PSS: GUESS AND CHECK

14) a) 6 9 8
    3 5 7
    2 1 4

Each time I add the two end entries and subtract the middle entry, I get 5.

PSS: Follow directions and look for a Pattern

1) 5 8 7
    2 4 6 2+4-6 = 4 ETC.
    1 0 3 1+3-0 = 4

Each time I add the two end entries and subtract the middle entry, I get 4.

PSS: Look for a pattern (see directions for 14a)

15) Encourage several different strategies

One solution:

PSS: Make a table / Look for a Pattern

<table>
<thead>
<tr>
<th># of Bikes</th>
<th># of Trikes</th>
<th># of Wheels</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>12</td>
<td>15×2+12×3 = 66</td>
</tr>
<tr>
<td>16</td>
<td>11</td>
<td>16×2+11×3 = 65</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>17×2+10×3 = 64 *Pattern (-4)</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>31×2+6×3 = 66</td>
</tr>
</tbody>
</table>

.; 21 Bikes and 6 Trikes

Second solution:

PSS: Draw a diagram. Note: Each circle is a set of 3 of them.

First make all the semi bikes. Then add a wheel to each until there are 60 wheels.

o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o o
### PSS: Make a Table / Guess and Check for a Pattern

<table>
<thead>
<tr>
<th># of 18¢ stamps</th>
<th># of 27¢ stamps</th>
<th>Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>12</td>
<td>20·18 + 12·27 = 684 (more 27¢ stamps)</td>
</tr>
<tr>
<td>15</td>
<td>17</td>
<td>15·18 + 17·27 = 729 (still more 27¢)</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>10·18 + 22·27 = 774 (less 27¢)</td>
</tr>
<tr>
<td>11</td>
<td>21</td>
<td>11·18 + 21·27 = 765 (almost)</td>
</tr>
</tbody>
</table>

Mr. McGlynn has 11-18¢ stamps and 21-27¢ stamps.

### PSS: Guess and Check

1. **ASK:** Does 4 have to be in the centre?

### PSS: Make a Table / Guess and Check

<table>
<thead>
<tr>
<th>Pencils</th>
<th>Markers</th>
<th>Dimes</th>
<th>Quarters</th>
<th># of 25¢ Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>11</td>
<td>2</td>
<td>1</td>
<td>8 (No) 489</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>11</td>
<td>0</td>
<td>9 Yes 489</td>
</tr>
</tbody>
</table>

### PSS: Guess and Check (Trial & Success)

1. **OR** 2

### PSS: Work Backwards

a) 3 4 3 4 6 0 7 3
b) 7 7 9

### C) One Possible Solution:

1. 1 6
2. 3 7

### d) PART C Has Several Solutions

Because only 2 numbers are given.
PSS: Work backwards & guess and check.

2) 3 15 12 other

8 16 8 solutions possible

5 19 11

6) 2 7 5

9 16 10 8 6

5 13 8 no solution

10 8 to this one

7 18 11 lousy not?

PSS: Make a table / trial & success

<table>
<thead>
<tr>
<th># of pennies</th>
<th># of nickels</th>
<th># of dimes</th>
<th># of quarters</th>
<th># of coins</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>62</td>
</tr>
</tbody>
</table>

2 pennies, 5 nickels, 1 dime, 1 quarter

One way: guess and check.

Alternate way: introduce variables / use logic

\[ a + b = 16 \]

\[ b + c = 15 \]

\[ a + b + c = 42 \]

\[ a + b + c = 21 \]

Since \[ a + b = 16 \]

\[ 16 + c = 21 \]

\[ a - c = 5 \]

\[ b + c = 15 \]

\[ a + 5 = 11 \]

\[ a = 6 \]
PSS: TRAIL & SUCCESS

(1)  (2)  (3)  (4)  (5)  (6)

PSS: USE VARIABLES - OR - GUESS AND CHECK.

a)  (9)  (1)  (2)  (3)  (7)  (1)  (2)
   2  3  0  8  2  3  7
   10  4  18  19  47  11  8  13  3  10  (1)

PSS: MAKE AN ORGANIZED LIST:

<table>
<thead>
<tr>
<th># of Nickels</th>
<th># of Dimes</th>
<th># of Quarters</th>
<th>Total Value (Cents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>2</td>
<td>55</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>3</td>
<td>75</td>
</tr>
</tbody>
</table>

PSS: MAKE AN ORGANIZED LIST:

1357  3157  5137  7135
1375  3175  5173  7153
1537  3517  5317  7315
1573  3571  5731  7351
1735  3715  5713  7513
1753  3751  5731  7531

10 DIFFERENT AMOUNTS

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**PSS: Make an organized list / make a table.**

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>WIDTH</th>
<th>AREA</th>
<th>PERIMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>72</td>
<td>72</td>
<td>144 in.</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td>72</td>
<td>72 in.</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>72</td>
<td>54 in.</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>72</td>
<td>48 in.</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>72</td>
<td>36 in.</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>72</td>
<td>36 in.</td>
</tr>
</tbody>
</table>

1. Possible dimensions are 1x72, 2x36, 3x24, 4x18, 6x12, 8x9 in.

2. 8x9 in. yields the smallest perimeter, 36 in.

---

**PSS: Make an organized list / make a table.**

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>WIDTH</th>
<th>PERIMETER</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>28</td>
<td>13 sq. cm.</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>28</td>
<td>24 sq. cm.</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>28</td>
<td>33 sq. cm.</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>28</td>
<td>40 sq. cm.</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>28</td>
<td>45 sq. cm.</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>28</td>
<td>48 sq. cm.</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>28</td>
<td>49 sq. cm.</td>
</tr>
</tbody>
</table>

1. Possible dimensions are 1x13, 2x12, 3x11, 4x10, 5x9, 6x8, 7x7 cm.

2. 7 cm by 7 cm yields the largest area (a square)

---

**PSS: Make a table / look for a pattern.**

<table>
<thead>
<tr>
<th>DAYS</th>
<th>HEAT CRIER</th>
<th>DAYS</th>
<th>GROTNUE</th>
<th>HEAT CRIER GROTNUE</th>
<th>HEAT CRIER GROTNUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>30</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>60</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>90</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>120</td>
<td>180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10 | 15 | 300 | 300 |
(31) PSS:
Draw a diagram

(32) PSS:
Draw a diagram

(33) PSS:
Draw a diagram / solve a simpler problem
Use results from #32 (above)
Top & bottom each move 11 posts per:

2 sides have only 9 posts (count edges correctly)

2 x 4 = 22
2 x 9 = 18

40 posts in all

(34) PSS:
Look for a pattern

1 + 2 + 3 + 4 + ... + 96 + 97 + 98 + 99 + 100

There are 50 pairs of sums of 101,

\[ \text{Sum is } 50 \times 101 = 5050 \]

(35) PSS:
Look for a pattern

1 + 2 + 3 + ... + 898 + 999 + 900

\[ \text{Sum is } 450 \times 901 = 405,450 \]
PSS: Look for a Pattern / Use Logic

36

\[ 2 + 4 + 6 + \ldots + 496 + 498 + 500 \]

\[ \text{Sum} \]

\[ 502 \]

\[ 502 \]

NOTE: There are only 250 numbers being added.
So there are only 125 pairs.
\[ \therefore 125 \times 502 = 62,750 \]

PSS: Look for a Pattern / Use Logic

37

\[ 1 + 3 + 5 + \ldots + 695 + 697 + 699 \]

\[ \text{Sum} \]

\[ 700 \]

NOTE: 350,000 numbers
175 pairs
\[ \therefore 125 \times 700 = 102,500 \]

PSS: Look for a Pattern

38

\[ \begin{array}{c}
1 \\
1 2 1 \\
1 3 1 \\
1 4 6 4 1 \\
1 5 10 10 5 1 \\
1 6 15 20 15 6 1 \\
1 7 21 35 35 21 7 1 \\
1 8 28 56 70 56 28 8 1 \\
1 9 36 84 126 126 84 36 9 1 \\
\end{array} \]

PSS: Look for a Pattern

39

<table>
<thead>
<tr>
<th>Row</th>
<th>Sum of Elements in Row</th>
<th>Row #</th>
<th>Guess</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>7</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>8</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>9</td>
<td>256</td>
<td>256</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Also, these numbers are the powers of 2.
PSS: LOOK FOR A PATTERN

1) 2, 5, 8, 11, 14, 17, 20  "ADD 3 TO PREVIOUS TERM"
2) 3, 6, 12, 24, 48, 96, 192, 384  "MULTIPLY PREVIOUS TERM BY 2"
3) 1, 3, 7, 11, 18, 29, 47, 76  "ADD 2 PREVIOUS TERMS"
4) 9, 9, 14, 25, 34, 49, 64, 81, 100  "PERFECT SQUARES. HOW MANY STEPS WILL IT TAKE TO ADD CONSECUTIVE ODD NUMBERS? 1 IT'S RIGHT!
5) 29, 33, 37, 41, 45, 49, 53, 57  "SUBTRACT 7 FROM PREVIOUS TERM"
6) 3, 9, 27, 81, 243, 729, 2187  "MULTIPLY PREVIOUS TERM BY 3"
   OR "THE POWERS OF 3"

PSS: DRAW A DIAGRAM, LOOK FOR A PATTERN "Gauss's Trick"

\[ \begin{align*}
1 \times 1 & = 1 \\
3 \times 3 & = 9 \\
6 \times 5 & = 30 \\
10 \times 7 & = 70 \\
\end{align*} \]

For the least one: \(1 + 2 + 3 + 4 + 5 = 15\) \(\text{FACTORED}\) \(\star\)

\[ \begin{align*}
1 + 2 + 3 + 4 + 5 & = 15 \\
17 \times 9 & = 153 \end{align*} \]

\(\star\) THIS PROBLEM IS A CARNIVAL PIA OF PROBLEM SOLVING STRATEGIES!

PSS: ELIMINATE POSSIBILITIES, DRAW A CHART

<table>
<thead>
<tr>
<th>S</th>
<th>B</th>
<th>W</th>
<th>S</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>S</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>M</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>D</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

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**PSS: Work Backwards**

a) 39 × 2 = 78; 78 + 18 = 96; 96 ÷ 6 = 16; 16 - 7 = 9

b) 57 × 2 = 114; 114 + 18 = 132; 132 ÷ 6 = 22; 22 - 7 = 15

**PSS: Eliminate Possibilities, Logic**

**Coats**
- L was wearing M's coat → C must be wearing L's coat.
- M was wearing C's coat.

**Hats**
- L was wearing C's hat → M must be wearing L's hat.
- C was wearing M's hat.

**PSS: Eliminate Possibilities, Logic**

**Control:** Bob; **Forward:** Mitz; **Goal:** Jane

**PSS: List All Possibilities**

\[
\begin{align*}
4N + 1P & \quad N + 1P \\
2N + 11P & \quad 3N + 1P \\
D + 3N + P & \quad 2P \\
D + 11P & \quad 1D + 1N + 1P \\
D + 1P & \quad 1 \text{ ways}
\end{align*}
\]

**PSS: Work Backwards**

11 + 7 = 18; 18 ÷ 2 = 9

**PSS: Look for a Pattern**

a) 21 + 23 + 25 + 27 + 29 = 105 = 5³
   \[31 + 33 + 35 + 37 + 39 + 41 = 216 = 6³\]
   \[43 + 45 + 47 + 49 + 51 + 53 + 55 = 343 = 7³\]

b) 1, 3, 7, 13, 21, 31, 43, 57, 73, 91
   \[\text{(400 2, 4, 6, 8, 10, ... F sequence number)}\]

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14+16+18+20 = 4^2 + 4
22 + 24 + 26 + 28 + 30 = 5^2 + 5
32 + 34 + 36 + 38 + 40 + 42 = 6^2 + 6

50. PSS: Brain Teasing (Logic)
Cut + Car + Go = Chicago

51. PSS: Logic
365 x 2 = 730 hours in a year
1,000,000 ÷ 730 = 1,361.5 (to nearest tenth)

52. PSS: Logic
Maximum: 5 Candy Bars per Minute
60 minutes = 100,

\[
\frac{3}{4} \times 100 = 75 \text{ for minutes}
\]
Total Time: 100 + 75 = 175 total candy bars

53. PSS: Follow Directions
12 x 6 = 6^2 - 2(12) + 12

12 x 4 = 12^2 - 2(12) + 144

54. PSS: Logic
3 x 180 = 540, 540 ÷ 45 = 12

55. PSS: Work Backward, Trial & Success
If Dec. 31 is an Sunday 24, 17, 10, 3 4th on Sunday, 5 more
If Dec. 31 is on Monday or Tuesday—same problem.
Sunday, Monday, Tuesday

56. PSS: Look for a Pattern
200 = (2^9) - 16
25 = (5^9) - 25

\[
3^5 = (3^9)^{\frac{5}{9}} = 27^{\frac{5}{9}}
\]
PSS: USE A FORMULA

\[ A_{rectangle} = 16 \times 8 = 128 \]
\[ A_{triangle} = \frac{1}{2} (8)(8) = 32 \]
\[ A_{irregular} = 128 - 32 = 96 \text{ sq. units} \]

PSS: LOOK FOR A PATTERN

\[ 50, 51, 2 \text{ tickets} \]
\[ 51 - 50 = 1, +1 = 2 \]
\[ 52, 53, 54, 3 \]
\[ 53 - 52 = 2, +1 = 3 \]
\[ 54, 55, \ldots, 84 \]
\[ 84 - 50 = 34, +1 = 35 \]
\[ 35 \times 4 = 140 \]

NOTE: MOST COMMON WEARING ANGULAR: \( \theta \) by \( \gamma = 84; \) \( 35 \times 4 = 140 \)

PSS: LOOK FOR A PATTERN

SIMPLIFY FIRST: \( \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} = \frac{1}{27} \)

PSS: LOOK FOR A PATTERN

\[ 3^3 = 3 \]
\[ 3^3 = 8 \times 3 = \text{ends in } 3 \]
\[ \frac{3}{2} = 9 \]
\[ \frac{3}{2} = 3 + 3 \times 3 = \text{ends in } 9 \]
\[ 3^3 = 27 \]
\[ 3^3 \text{ ends in } 7 \]
\[ 3^3 = 27 \]
\[ 3^3 \text{ ends in } 1 \]

Units Dist: 3, 9, 7, 1, 3, 9, 7, 1

\[ \begin{array}{c}
1, 3, 9, 7, 1, 3, 9, 7, 1 \\
\hline
1006 \\
\hline
4 \sqrt{27} \\
\hline
\end{array} \]

PSS: LOOK FOR A PATTERN

\[ 1, 4, 10, 19, 31, \ldots \]
\[ +3 +6 +9 +12 +15 \]
\[ 31 + 15 = 46 \]

PSS: FOLLOW DIRECTIONS

\[ (-6 \times 4) = (-6)^2 + 4 = 40 \]
\[ 40 \times \theta = (40)^2 \times \theta = 1600 \]
PSS: DRAW A DIAGRAM (VENN DIAGRAM)

NOTE: FILL IN NUMBERS "INSIDE-OUT".

ADD 'EM UP: 290 STUDENTS

PSS: DRAW A PICTURE (ALT IT OUT)

24" = 24 ft.

36" = 36 ft.

2" x 2' = EITHER

18 - 2" x 8 - 3" = 144
either

12 - 2" x 12 - 3" = 144
either

PSS: 1 WAY: ALGEBRA X = UNKNOWN SCORE

139 + 143 + 144 + x = 145 \times 4 \Rightarrow x = 154

2nd WAY: LOGIC

IF AVERAGE NEEDS TO BE 145, AND THERE ARE 4 SCORES

THE SUM IS 4 \times 145 = 580.

FROM 580, SUBTRACT 139, 143, 144.

WHAT IS LEFT IS THE MISSING SCORE: 154

3rd WAY: BE CLEVER / MAKE A CHEAT

GAME SCORE AVERAGES TOTAL-

1 139 - 6 - 6
2 143 - 2 - 8
3 144 - 1 - 9

so, on 4th game - need to be 79 over average

\Rightarrow 145 + 9 = 154

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PSS: MAKE A CHART

<table>
<thead>
<tr>
<th>TEST</th>
<th>AWAY FROM AVG</th>
<th>TOTAL FROM AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>2</td>
<td>-2</td>
<td>-7</td>
</tr>
<tr>
<td>3</td>
<td>+3</td>
<td>-4</td>
</tr>
</tbody>
</table>

On the 4th test, Raymond needs to be +4 above the average.

\[ 90 + 4 = 94 \]

PSS: LOOK FOR A PATTERN

Every 7 days it will be Tuesday again.

100 + 7 = 14 R 2.

Tuesday +1 = Wednesday

PSS: NUMBER SENSE

Must be a multiple of 2, 3, 4, 5, 6.

One answer is 2 x 3 x 4 x 5 x 6 = 720, but it is too big.

Need 2, 3, another 2 (or 4), 5, for 6—we already have 2, 3.

\[ 2 \times 3 \times 2 \times 5 = 60 \]

Check:
120 \( \div 2 = 60 \)
48 \( \div 2 = 24 \)
60 \( \div 15 = 4 \)
60 \( \div 2 = 30 \)
60 \( \div 10 = 6 \)

PSS: KNOW RULES OF DIVISIBILITY / TRIAL & ERROR

Rule: If a number is divisible by 9, the sum of its digits is divisible by 9.

\[ 3 + A + 1 = 9 \]

\[ \Rightarrow A = 5 \text{ \_ NOPE} \]

\[ 3 + 6 + A + 1 = 16 \]

(A = 7 \_ OK \_ ONLY ANSWER)

\[ 3 + 8 + A + 1 = 27 \]

A = 11 \_ NOPE

\[ 3 + A + A + 1 = 27 \]

A = 11 \_ NOPE
PSS: LOGIC

11 equal sized squares makes 176 sq. cm.

176 ÷ 11 = 16 sq. cm for each square.

Length of each side is 4 cm.

⇒ Perimeter = 24 x 4 = 96 cm (*units)

PSS: MAKE AN ORGANIZED LIST

Let the colors be A, B, C, D, E.

A B C D E 1 or FW
A B C D E 2 " "
A B C D E 3 " "
A B C D E 4 " "

20 beads picked, 21st must make a set of 5 beads.

1 2 Acks

PSS: MAKE AN ORGANIZED LIST / DRAW A PICTURE IF NECESSARY

<table>
<thead>
<tr>
<th>L</th>
<th>W</th>
<th>P</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Repeat

PSS: WORK BACKWARDS

<table>
<thead>
<tr>
<th>T</th>
<th>M</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tuesday 18

25
PSS: MAKE A TABLE / GUESS 'N CHECK

<table>
<thead>
<tr>
<th>DAYS</th>
<th>ANN</th>
<th>DAYS</th>
<th>SUE</th>
<th>ANN EARN</th>
<th>SUE EARN</th>
<th>ANN</th>
<th>SUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>1:60</td>
<td>6</td>
<td>6:36 = 216</td>
<td>Too Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>2:60</td>
<td>12</td>
<td>7:36 = 252</td>
<td>Too Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>10:60=600</td>
<td>15:36 = 540</td>
<td>Too High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>7:60 = 420</td>
<td>12:36 = 432</td>
<td>Too Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>8:60 = 480</td>
<td>13:36 = 468</td>
<td>Too Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>12.5</td>
<td>7.5:60 = 450</td>
<td>12.5:36 = 450</td>
<td>Both</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Ann worked 7.5 days; Sue worked 12.5 days*

PSS: LOGIC

Each person in the 3-person can work 24 days.

If one person did the job, it would take 3 x 24 = 72 days.

4 people would take 72 / 4 = 18 days to do the job.

PSS: Solve Smaller Problems

One's place: The digit '1' appears in the one's place once in every group of 10 consecutive numbers.

So such groups = 50 times

Ten's place: 10 times in every group of 100

So such groups = 5 x 10 = 50

Hundred's place: 100 times in every group of 1000

So such groups = 50 + 100 = 200 times

PSS: LOGIC / NUMBERSense / Trial & Success

We want the numerator to be the largest.
While we want the denominator to be the smallest.

x - y = 1 is smallest

LMAT

So, 50 + y = 99

So, y = 49

x = 50

C 2001 Reardon Problem Solving Gifts, Inc.
PSS: Understand the concept of average

Since the avg of 5 containers is 13 L,
the total capacity is 5 x 13 = 65 L.
The sixth container adds 7 L.
65 + 7 = 72, 72 / 6 = 12 L

PSS: Solve smaller problems / make a table

<table>
<thead>
<tr>
<th>Size of Squares</th>
<th># of Squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 1</td>
<td>21</td>
</tr>
<tr>
<td>2 x 2</td>
<td>12</td>
</tr>
<tr>
<td>3 x 3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

PSS: Work backwards

Start with the # that remained.
If she lost 2/3, then the # x represents 1/3.
So Emily had $12. After she spent some money,
since she spent $3 to get down to $9,
$12 must be 4/3 of the money which would
be **$36** in the beginning.

PSS: Draw a diagram

WEDNESDAY  WEDNESDAY  THURSDAY  THURSDAY  CANY  NO

PSS: Guess 'n' check or algebra

Note: Most common wrong answer is * in all the case.

<table>
<thead>
<tr>
<th>Case</th>
<th>Canned</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>5</td>
<td>105</td>
<td>110</td>
</tr>
</tbody>
</table>

* All the Case
P.S.S: WORK BACKWARDS

Sarah had $10 before her last purchase in the second store. This is half of the money she had when she entered the second store, so she had $20.

When she entered the first store, she had $10 more than this, or $30, before she made her final purchase, since $30 is half of the money she had when she entered the first store. So she had $60 when she entered.