Kellie
Coble

Amanda Wilson   Reva Holderfield

Jessy J Thompson

The problem

Mr. Frank Graham, from Elkhart District in Indiana, has just inherited a historic hotel. He would like to keep the hotel, but has little experience in hotel management. The whole district community is willing to help him out, because this hotel represents a major attraction for visitors, and thus, monetary sources for everyone.

Elkhart Middle School has been assigned to help determine how much should be charged per day for each of the 80 rooms in the hotel to maximize Mr. Graham's profits. From previous experience, they've been told that all rooms are occupied when the daily rate is $60 per room. Each occupied room has a $4 cost for service and maintenance per day. They also have been told that for every dollar increase in the daily $60 rate, there is a vacant room.

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Develop a tool to students in Elkhart Middle School that can help Mr. Graham solve his problem, giving complete instructions on how they can use this tool.

$$\$60/room \cdot 80\,rooms - (4 \cdot 80) = \$4486$$
$$\$61/room \cdot 79\,rooms - (84 \cdot 79) = 4503$$
$$\$62/room \cdot 78\,rooms - (4 \cdot 78) = 4524$$
$$\$63/room \cdot 77\,rooms - (4 \cdot 77) = 4543$$
$$\$64/room \cdot 76\,rooms - (4 \cdot 76) = 4540$$
$$\$65/room \cdot 75\,rooms - (4 \cdot 75) = 4515$$
$$\$66/room \cdot 74\,rooms - (4 \cdot 74) = 4588$$
$$\$67/room \cdot 73\,rooms - (4 \cdot 73) = 4159$$
$$\$68/room \cdot 72\,rooms - (4 \cdot 72) = 4672$$
$$\$69/room \cdot 71\,rooms - (4 \cdot 71) = 4684$$
$$\$70/room \cdot 70\,rooms - (4 \cdot 70) = 4619$$
$$\$71/room \cdot 69\,rooms - (4 \cdot 69) = 4623$$
$$\$72/room \cdot 68\,rooms - (4 \cdot 68) = 4624$$
$$\$73/room \cdot 67\,rooms - (4 \cdot$$
$$\$74/room \cdot 66\,rooms -$$
$$\$75/room \cdot 65\,rooms -$$
$$\$76/room \cdot 64\,rooms -$$
$$\$77/room \cdot 63\,rooms -$$
$$\$77/room \cdot 62\,rooms -$$
$$\$78/room \cdot 61\,rooms -$$
$$\$79/room \cdot 60\,rooms -$$
$$\$80/room$$

4864   4360

4,875
260

4684   4899
244   278

4891   4896   4818
272   272   268

272

4864
244

Tool

Jessy, Kellie,
Reva, Ananda.
Pd 2 9-22-00

$60.00/\text{rms} \cdot 80\text{rms} - (\$4 \cdot 80) = \$4,480.00$

$61.00/\text{rms} \cdot 79\text{rms} - (\$4 \cdot 79) = \$4,503.00$

$62.00/\text{rms} \cdot 78\text{rms} - (\$4 \cdot 78) = \$4,524.00$

$63.00/\text{rms} \cdot 77\text{rm} - (\$4 \cdot 77) = \$4,543.00$

$64.00/\text{rms} \cdot 76\text{rms} - (\$4 \cdot 76) = \$4,540.00$

$65.00/\text{rms} \cdot 75\text{rms} - (\$4 \cdot 75) = \$4,575.00$

$66.00/\text{rms} \cdot 74\text{rms} - (\$4 \cdot 74) = \$4,588.00$

$67.00/\text{rms} \cdot 73\text{rms} - (\$4 \cdot 73) = \$4,159.00$

$68.00/\text{rms} \cdot 72\text{rms} - (\$4 \cdot 72) = \$4,672.00$

$69.00/\text{rms} \cdot 71\text{rms} - (\$4 \cdot 71) = \$4,684.00$

$70.00/\text{rms} \cdot 70\text{rms} - (\$4 \cdot 70) = \$4,619.00$

$71.00/\text{rms} \cdot 69\text{rms} - (\$4 \cdot 69) = \$4,633.00$

$72.00/\text{rms} \cdot 68\text{rms} - (\$4 \cdot 68) = \$4,624.00$

$73.00/\text{rms} \cdot 67\text{rms} - (\$4 \cdot 67) = \$4,623.00$

$74.00/\text{rms} \cdot 66\text{rms} - (\$3 \cdot 66) = \$4,620.00$

$75.00/\text{rms} \cdot 65\text{rms} - (\$2 \cdot 65) = \$5,135.00$

$76.00/\text{rms} \cdot 64\text{rms} - (\$1 \cdot 64) = \$8,128.00$

$77.00/\text{rms} \cdot 63\text{rms} - (\$0 \cdot 63) = \$8,001.00$

$78.00/\text{rms} \cdot 62\text{rms} - (\$49 \cdot 62) = \$$

$79.00/\text{rms} \cdot 61\text{rms} - (\$48 \cdot 61) = \$$

$80.00/\text{rms} \cdot 60\text{rms} \cdot (\$48 \cdot 60) = \$7680.00$

We did this by taking $60.00 & going up
until we got to 80. & We went down from 80 to
60 until we got the anser. We multiplyed $60.00
by 80rms then multiplyed $4.00 by 80 & added both of
the answers & got $4,480.00

Matt Cook
Corey Fillinger

Vacant room	60	59	58	57	56	55	54	53
	80	81	82	83	84	85	86	87
	00	59	116	171	224	275	324	371
	4800	4720	4640	4560	4480	4400	4320	4240
	4,800	4,779	4,756	4,731	4,704	4,675	4,644	4,611

52	51	50	75
88	89	90	65
416	459		375
4160	4080		4500
4,576	4,539		4875

4,620

4896

4,624

4,896

4,624

Room/Cost	gross amount	total amount	service cost
68172	4,896	4,624	272

Room multiplied by price is the gross amount.
Room multiplied by service charge total service charge.
total Service charge subtracted from gross amount.

That would equal the most amount of money you could get in a day.

Matt Cook

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Room /Cost   Gross Amount   Total Amount

68 /$72 $4,896 $4,624

4620

He could charge $70 for the rate per room, which would make 70 rooms in the hotel occupied. This would give him the most profit.

How we got this.

(rate per room · amount of occupied room) − [maintenance per room · occupied rooms]
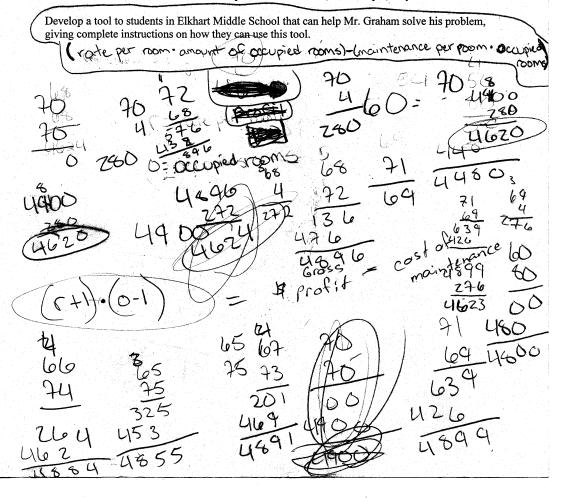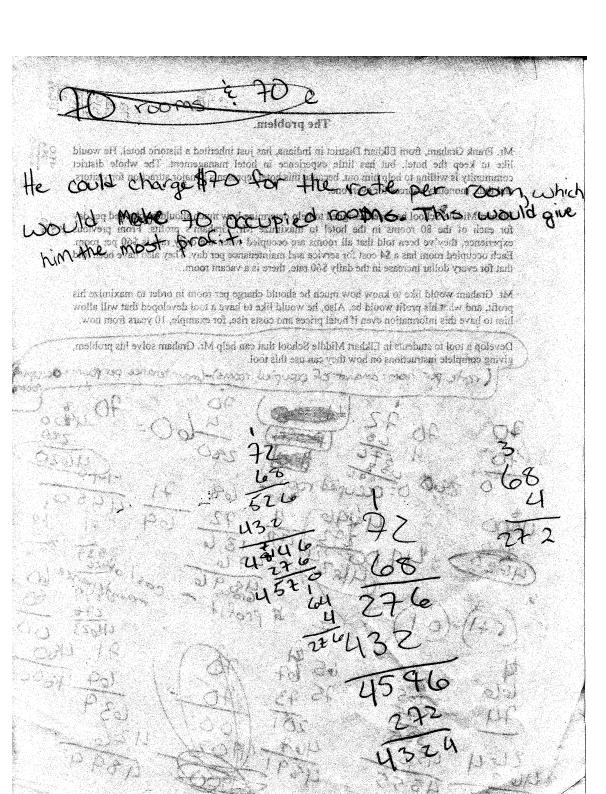
4620

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(rate per room · amount of occupied rooms) − (maintenance per room · occupied rooms)

$$(r+1) \cdot (o-1)$$

Kaylee, Ben, Alex, Robert

~~Mr Frank Graham will have to have seventy rooms and please seventy dollars and he will get four thousand, six hundred twenty counting clean expenses.~~

Total

If Mr Graham charges seventy one dollars per sixty nine rooms and cleaning he will have four thousand, six hundred twenty three.

Mr. Graham will multiply ~~Seventy one~~ dollars with ~~Sixty nine~~ rooms and he should get four thousand, eight hundred ninty nine. Then multiply ~~four~~ dollars by sixty nine you should get two hundred seventy six. Then subtract four thousand ~~ninty nine~~ and two hundred seventy six you should get four thousand six hundred twenty three.

eight hundred

This is if they took his taxes out of ~~his~~ pay check

$$\begin{array}{r} 80 \\ \times 4 \\ \hline 320 \end{array}$$

Rooms • Cost =   profit

80	•	60	4800			4480	$140

70 • 70 = 4900 - 280 = 4620

69 × 71 = 4899 - 276 = 4623

65   75   4875 - 260 = 4615

79 • 61 = 4819

✱ 68 • 72 = 4896 - 272 = (4624) $144

67 • 73 = 4991 - 268 = 4623

66 • 74 = 4884 - 264 = 4620

72 × 68 = 4896 - 288 - 4608

58 × ~~92~~ 5104 - 232 = 4872 ~~$~~

60 × 80 = 4800 - 240 = 4560

57 × 89 = 5073 - 228 = 4945

59 • ~~81~~ 5133 - 236 = 4897 ~~$~~

cleaning

✱ 68 • 72 = 4896 - 272 = 4624

$144
profit

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Chart

Cost of room	number of occupied room	lost money for maintenance	total income
$60	80	$320	$4,480
$61	79	$316	$4,503
$62	78	$312	$4,524
$63	77	$308	$4,543
$64	76	$304	$4,560
$65	75	$300	$4,575
$66	74	$296	$4,588
$67	73	$292	$4,599
$67	72	$288	$4,608
$68	71	$284	$4,615
$69	70	$280	$4,620
$70	69	$276	$4,623
$71	68	$272	$4,624
$72	67	$268	$4,623

$$C \cdot N - MN = T$$

Step 1 -   80 rooms = 4800
                          x
                        $60
                          =
                        4800
                      - $320   80
                        4480   x 4   cleaning
                                  $ 320

Step 2 - 4 for cleaning
multiplied by the 80 rooms,

Step 3 - Step 3 -

Step 3 -