Section 11.3 Math Link

This worksheet will help you with the Math Link on page 407.

Jim has decided to make a new code. He has written a new message to his friend using the new code:

 60 24 27 57 / 9 45 12 15 / 27 57 / 63 42 6 54 15 3 33 3 6 36 15

Note: Spaces separate letters and the symbol "/ " separates words.

1. The letter E is the most common letter in English. Predict what number represents E. _____

2. Jim started with this code.

1 = a	2 = b	3 = c	4 = d	5 = e	6 = f	7 = g
8 = h	9 = i	10 = j	11 = k	12 = l	13 = m	14 = n
15 = o	16 = p	17 = q	18 = r	19 = s	20 = t	21 = u
22 = v	23 = w	24 = x	25 = y	26 = z		

He used an equation in the form $ax = b$ or $\dfrac{x}{a} = b$ to change the letters in the message. In this equation,
x = original number
a = what you will multiply or divide the original number by
b = new number for each letter

Use the equation to check if the number you predicted represents E.
original number = 5
new number for letter = 15

Try with $ax = b$.	**Try with $\dfrac{x}{a} = b$.**
$ax = b$ $a \times 5 = 15$ $a = 3$	$\dfrac{x}{a} = b$ $\dfrac{5}{a} = 15$ Can you solve this? YES NO If you said NO, try the solution $a = 3$ on other numbers in the code and see if you get a word.

3. If #2 is correct, the first word with an E is 9 45 12 15. Decode the other letters.

A letter is 9.
ax = b
$x \times 3 = 9$
What is *x*? _____   Identify this letter: _____

A letter is 45.
ax = b
$x \times 3 = 45$
What is *x*? _____   Identify this letter: _____

A letter is 12.
ax = b
$x \times 3 = 12$

What is *x*? _____   Identify this letter: _____

What word does 9 45 12 15 represent? _____

4. Now try to decode the first word: 60 24 27 57.

A letter is 60.
ax = b
$x \times 3 = 60$
What is *x*? _____   Identify this letter: _____

A letter is 24.
ax = b
$x \times 3 = 24$
What is *x*? _____   Identify this letter: _____

A letter is 27.
ax = b
$x \times 3 = 27$
What is *x*? _____   Identify this letter: _____

A letter is 57.
ax = b
$x \times 3 = 57$
What is *x*? _____   Identify this letter: _____

What word does 60 24 27 57 represent? _____

5. You have already decoded the letters in the third word (27 57).

27 is the letter _____.

57 is the letter _____.

27 57 represents _____

6. Use the steps above to decode 63 42 6 54 15 3 33 3 6 36 15.

7. Write the entire message.