Name _____

Critical Thinking

You can add products to find other products.

1. Draw an array of 5×9. Shade the array to show that $(3 \times 9) + (2 \times 9) = 5 \times 9$.

2. How could you use the product of 9×7 and the product of 8×7 to find the product of 17×7?

_____

3. Find 12×17 by adding two products.

a. $12 \times 17 = (12 \times$ _____ $) + (12 \times$ _____ $)$

b. $12 \times 17 =$ _____ $+$ _____

c. $12 \times 17 =$ _____

d. What other numbers have a sum of 17? _____

4. Find what number multiplied by 9 equals 135.

a. $9 \times$ _____ $= 81$

b. $9 \times$ _____ $= 54$

c. $81 + 54 =$ _____

d. $9 \times$ _____ $= 135$

5. $7 \times 11 = 77$ and $25 \times 7 = 175$. Explain how you could use these products to find 7×14. Then find 7×14.

_____

6. Find 24×4 by adding 3 products.

a. $24 \times 4 =$ (_____ $+$ _____ $+$ _____ $) \times 4$

b. $24 \times 4 =$ (_____ $\times 4) + ($_____ $\times 4) + ($_____ $\times 4)$

c. $24 \times 4 =$ _____ $+$ _____ $+$ _____

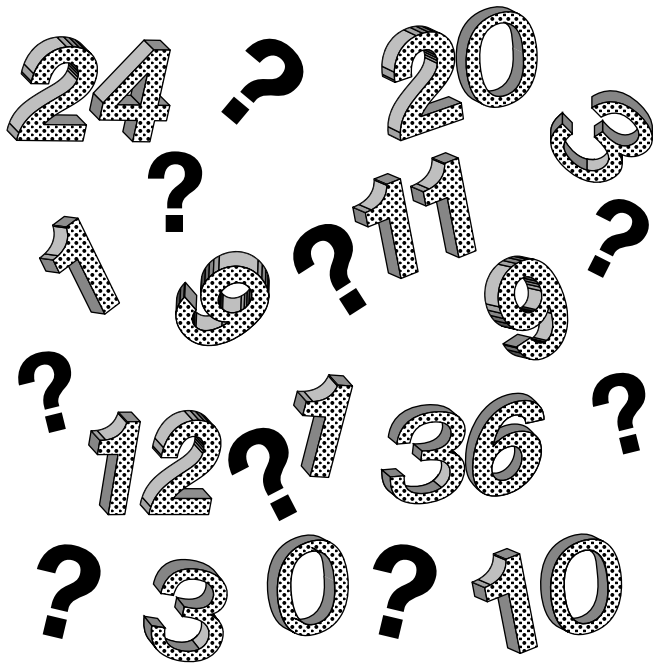
d. $24 \times 4 =$ _____

© Scott Foresman Addison Wesley 4

Name _____

Critical Thinking

Answer the riddles using the numbers below.



1. I am a 2-digit number. I am divisible by 5 and 2. I am less than 20. What number am I? _____

2. I am a 1-digit number. I am only divisible by myself. If you multiply a number by me, you get that number. What number am I? _____

3. I am a 2-digit number. I am divisible by 1, 2, 3, 4, 6, 9, 12, 18, and 36. I am less than 50. What number am I? _____

4. I am a 1-digit number. I am a factor of 18, 27, 36, and 45. I am not 1. I am less than 5. What number am I? _____

5. I am a 2-digit number. I am divisible by 6 different numbers that include 3, 4, and 6. I am a factor of 12, 24, 36, and 48. What number am I? _____

6. I am a 2-digit number. I am a factor of 80, 60, 40, and 20. I am divisible by 6 different numbers that include 4, 5, and 10. What number am I? _____

7. I am a 1-digit number. I only have 2 factors. I am a factor of 6, 9, and 12. What number am I? _____

8. I am a 1-digit number. If you multiply any number by me, you always get the same product. What number am I? _____

© Scott Foresman Addison Wesley

Name _____

Critical Thinking

Your teacher has given you this challenge.

“Here are 150 squares of paper. Create 3 pyramid shapes on the bulletin board. Each pyramid must be one row higher than the last. The top row of every pyramid will be one block long and every row must be two squares longer than the row above it. The team that uses the most squares wins.”

Your team won! You used 149 squares to make 3 pyramids on the board.

1. **a.** How many rows did your first pyramid have? _____

   b. How many total blocks? _____

2. **a.** How many rows did your second pyramid have? _____

   b. How many total blocks? _____

3. **a.** How many rows did your third pyramid have? _____

   b. How many total blocks? _____

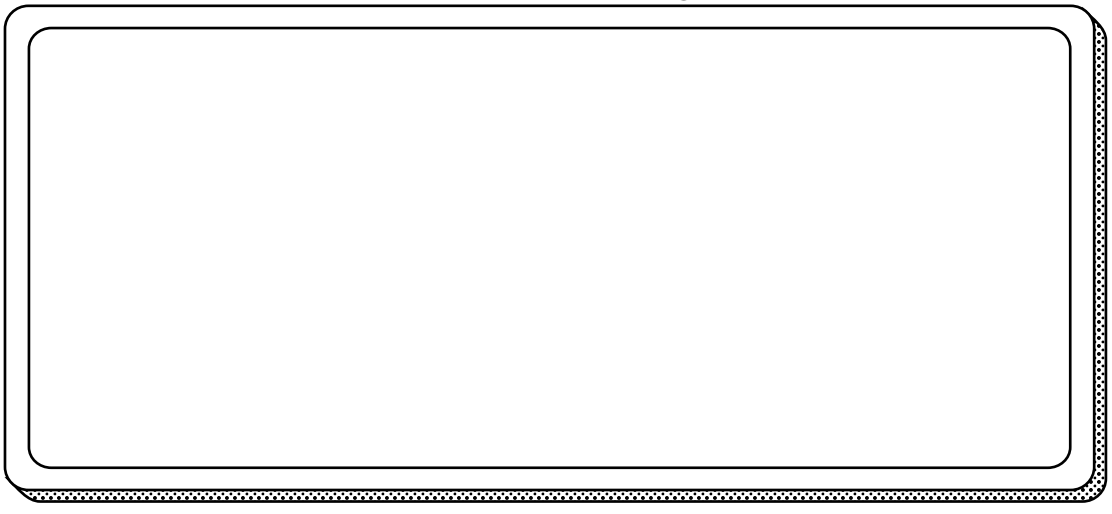
4. Describe patterns you see in the number of blocks for each pyramid.

   _____

   _____

5. Draw a pyramid with 25 blocks using the pattern above.

Pyramid Challenge



© Scott Foresman Addison Wesley

Name _____

Critical Thinking

Suppose you are an ancient Egyptian stone worker. The Queen has hired you to make a pyramid sculpture for her garden.

"I will give you 140 blocks of stone," she said. "Do not waste them."

The Queen showed you a model using 14 blocks. The model is 3 blocks high. The top layer has 1 block, the 2nd layer has 4 blocks, and the 3rd layer has 9 blocks.

A mathematician whispered to you, "You will be able to use all the blocks if you follow the Queen's model. Just look for the pattern."

After a while, the pattern becomes clear. You build the pyramid, using all the blocks, and are richly rewarded by the Queen.

1. How many layers did your finished pyramid have? _____

2. How many blocks did you use for each layer?

_____

3. Describe the pattern the mathematician was talking about.

_____

_____

_____

4. Could you make another pyramid with 200 blocks following the same pattern? Explain.

_____

_____

5. How many blocks of stone would you need to follow the same pattern and make a pyramid:

a. 8 blocks high? _____

b. 9 blocks high? _____

c. 10 blocks high? _____

© Scott Foresman Addison Wesley 4

Name _____

Critical Thinking

Suppose you are an ancient Egyptian stone worker. The Queen has hired you to make a pyramid sculpture for her garden.

"I will give you 140 blocks of stone," she said. "Do not waste them."

The Queen showed you a model using 14 blocks. The model is 3 blocks high. The top layer has 1 block, the 2nd layer has 4 blocks, and the 3rd layer has 9 blocks.

A mathematician whispered to you, "You will be able to use all the blocks if you follow the Queen's model. Just look for the pattern."

After a while, the pattern becomes clear. You build the pyramid, using all the blocks, and are richly rewarded by the Queen.

1. How many layers did your finished pyramid have? _____

2. How many blocks did you use for each layer?

_____

3. Describe the pattern the mathematician was talking about.

_____

_____

_____

4. Could you make another pyramid with 200 blocks following the same pattern? Explain.

_____

_____

5. How many blocks of stone would you need to follow the same pattern and make a pyramid:

a. 8 blocks high? _____

b. 9 blocks high? _____

c. 10 blocks high? _____

© Scott Foresman Addison Wesley 4

Name _____

Critical Thinking

You can add products to find other products.

1. Draw an array of 5×9. Shade the array to show that $(3 \times 9) + (2 \times 9) = 5 \times 9$. **Student should draw a 5×9 array. Look for shading to show 3×9 and 2×9.**

2. How could you use the product of 9×7 and the product of 8×7 to find the product of 17×7?

Add the products of 9×7 and 8×7.

3. Find 12×17 by adding two products. **Possible answer:**

a. $12 \times 17 = (12 \times$ **10** $) + (12 \times$ **7** $)$

b. $12 \times 17 =$ **120** $+$ **84**

c. $12 \times 17 =$ **204**

d. What other numbers have a sum of 17? **Possible answer: 12 and 5**

4. Find what number multiplied by 9 equals 135.

a. $9 \times$ **9** $= 81$

b. $9 \times$ **6** $= 54$

c. $81 + 54 =$ **135**

d. $9 \times$ **15** $= 135$

5. $7 \times 11 = 77$ and $25 \times 7 = 175$. Explain how you could use these products to find 7×14. Then find 7×14.

Find $175 - 77$; $7 \times 14 = 98$

6. Find 24×4 by adding 3 products.

a. $24 \times 4 = ($**10** $+$ **10** $+$ **4** $) \times 4$

b. $24 \times 4 = ($**10** $\times 4) + ($**10** $\times 4) + ($**4** $\times 4)$

c. $24 \times 4 =$ **40** $+$ **40** $+$ **16**

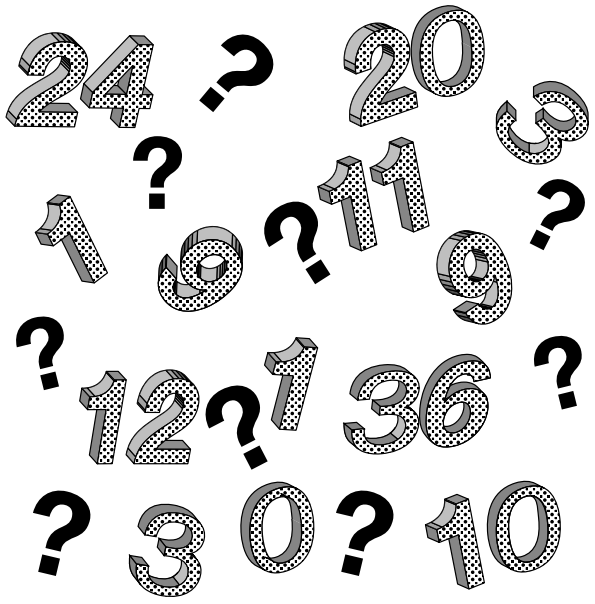
d. $24 \times 4 =$ **96**

© Scott Foresman Addison Wesley

Name _____

Critical Thinking

Answer the riddles using the numbers below.



1. I am a 2-digit number. I am divisible by 5 and 2. I am less than 20. What number am I? **10**

2. I am a 1-digit number. I am only divisible by myself. If you multiply a number by me, you get that number. What number am I? **1**

3. I am a 2-digit number. I am divisible by 1, 2, 3, 4, 6, 9, 12, 18, and 36. I am less than 50. What number am I? **36**

4. I am a 1-digit number. I am a factor of 18, 27, 36, and 45. I am not 1. I am less than 5. What number am I? **3**

5. I am a 2-digit number. I am divisible by 6 different numbers that include 3, 4, and 6. I am a factor of 12, 24, 36, and 48. What number am I? **12**

6. I am a 2-digit number. I am a factor of 80, 60, 40, and 20. I am divisible by 6 different numbers that include 4, 5, and 10. What number am I? **20**

7. I am a 1-digit number. I only have 2 factors. I am a factor of 6, 9, and 12. What number am I? **3**

8. I am a 1-digit number. If you multiply any number by me, you always get the same product. What number am I? **0**

© Scott Foresman Addison Wesley 4

Name _____

Critical Thinking

Your teacher has given you this challenge.

"Here are 150 squares of paper. Create 3 pyramid shapes on the bulletin board. Each pyramid must be one row higher than the last. The top row of every pyramid will be one block long and every row must be two squares longer than the row above it. The team that uses the most squares wins."

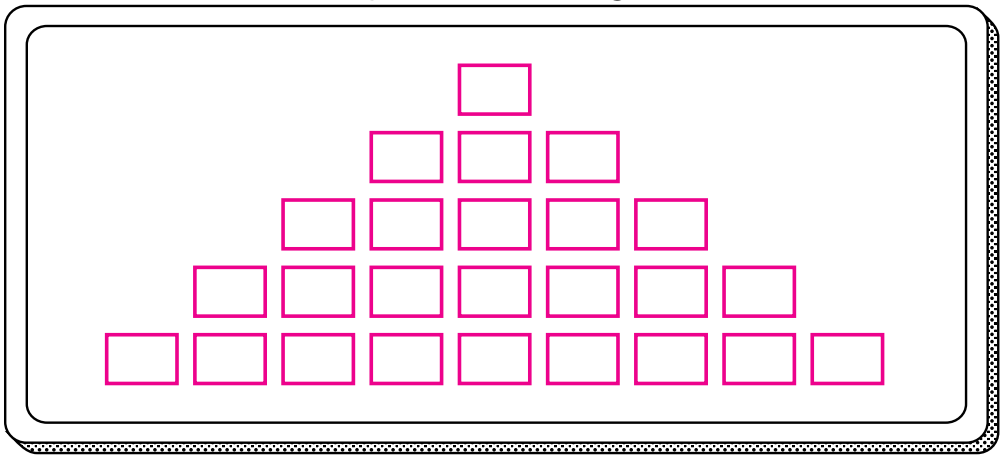
Your team won! You used 149 squares to make 3 pyramids on the board.

1. **a.** How many rows did your first pyramid have? 6
   b. How many total blocks? 36
2. **a.** How many rows did your second pyramid have? 7
   b. How many total blocks? 49
3. **a.** How many rows did your third pyramid have? 8
   b. How many total blocks? 64
4. Describe patterns you see in the number of blocks for each pyramid.

   Possible answer: To calculate the number of total blocks for each pyramid, multiply the number of rows by itself.

5. Draw a pyramid with 25 blocks using the pattern above.

Pyramid Challenge



© Scott Foresman Addison Wesley

Name _____

Critical Thinking

Suppose you are an ancient Egyptian stone worker. The Queen has hired you to make a pyramid sculpture for her garden.

"I will give you 140 blocks of stone," she said. "Do not waste them."

The Queen showed you a model using 14 blocks. The model is 3 blocks high. The top layer has 1 block, the 2nd layer has 4 blocks, and the 3rd layer has 9 blocks.

A mathematician whispered to you, "You will be able to use all the blocks if you follow the Queen's model. Just look for the pattern."

After a while, the pattern becomes clear. You build the pyramid, using all the blocks, and are richly rewarded by the Queen.

1. How many layers did your finished pyramid have? 7

2. How many blocks did you use for each layer?
   (In order:) 1, 4, 9, 16, 25, 36, and 49

3. Describe the pattern the mathematician was talking about.
   The number of blocks per layer is determined by the next largest square number. (Or, layer 1 has 1×1 blocks, layer 2 has 2×2 or 4 blocks, layer 3 has 3×3 or 9 blocks, and so on.)

4. Could you make another pyramid with 200 blocks following the same pattern? Explain.
   No, to continue the pattern, the next layer should have 64 blocks. $140 + 64 = 204$

5. How many blocks of stone would you need to follow the same pattern and make a pyramid:
   a. 8 blocks high? 204
   b. 9 blocks high? 285
   c. 10 blocks high? 385

© Scott Foresman Addison Wesley