

PATTERNS DAY 6

Find the missing items in each of the following In-Out machines and find a rule. Express the rule in a complete sentence, describing how to find the out **in terms of the in**.

1.

IN	OUT
6	23
4	15
11	43
9	35
1	3
24	
	47

Rule:

2.

IN	OUT
CHP	BGO
IMT	HLS
WED	VDC
BUN	ATM
HOG	GNF
YET	
	FLY

Rule:

3.

IN	OUT
11	123
12	143
5	27
8	63
14	195
10	
	51

Rule:

4.

IN	OUT
CAP	XXX
IMP	yyy
CMR	x x
BAR	Z Z
BMP	zzz
	YY
IAR	

Rule

## PATTERNS DAY 9

Perform the following operations.

1.  $4 - 3 + 1$  1. \_\_\_\_\_
2.  $24 \div 2 \cdot 3$  2. \_\_\_\_\_
3.  $4 - 3 - 1$  3. \_\_\_\_\_
4.  $14 - 8 + 3 - 1$  4. \_\_\_\_\_
5.  $(5 - 2) \cdot 3^2$  5. \_\_\_\_\_
6.  $9 - (4 - 2)^2$  6. \_\_\_\_\_
7.  $14 - 2 \cdot 5 - 3$  7. \_\_\_\_\_
8.  $24 \cdot 4 \div 2$  8. \_\_\_\_\_
9.  $18 - 3^2$  9. \_\_\_\_\_
10.  $28 - 2 \cdot 3^2 + 3^2$  10. \_\_\_\_\_
11.  $(21 - (16 - (5 - 3)))$  11. \_\_\_\_\_
12.  $15 - 9 + 5 - 3 + 1$  12. \_\_\_\_\_
13.  $72 \div 9 \div 4 \div 2$  13. \_\_\_\_\_
14.  $4 \cdot 9 - 5 - 3 + 1$  14. \_\_\_\_\_
15.  $(12 - 3^2)^2 - 4^2 \div 2$  15. \_\_\_\_\_

Order of Operations Quiz  
PATTERNS AFTER DAY 9

Simplify each expression:

1.  $13 - 5 + 4 =$

4.  $\frac{2 \cdot 3 - 1}{3^2} =$

2.  $8 - 2^4 \div 2 =$

5.  $36 - (4 + 5 \cdot 4) =$

3.  $25 - [2(3 + 7) - 4 \div 4] =$

Order of Operations Quiz  
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## PATTERNS AFTER DAY 9

### QUIZ ORDER OF OPERATIONS

Perform the following operations.

1.  $7 - 2 + 3 - 1$  1. \_\_\_\_\_

2.  $18 \div 3 \cdot 2$  2. \_\_\_\_\_

3.  $(8 - 3) \cdot 2^2$  3. \_\_\_\_\_

4.  $13 - (5 - 2)^2$  4. \_\_\_\_\_

5.  $53 - 3 \cdot 2^2 + 4^2$  5. \_\_\_\_\_

6.  $15 - 9 + 5 - 3 + 1$  6. \_\_\_\_\_

7.  $48 \div 6 \div 2 \div 2$  7. \_\_\_\_\_

8.  $4 \cdot 9 - 6 \cdot 3 + 1$  8. \_\_\_\_\_

## Sigma Notation – Classwork

### PATTERNS DAY 11

Write out each of these summations problems as a string of numbers added together and find the given sum.

1.  $\sum_{i=1}^5 (2i) =$

5.  $\sum_{k=1}^5 6k =$

2.  $\sum_{i=0}^3 (3i \pm 1) =$

6.  $\sum_{i=0}^4 i^2 =$

3.  $\sum_{k=1}^4 9k =$

7.  $\sum_{k=0}^2 \frac{1}{k^2 + 1} =$

4.  $\sum_{n=2}^6 (5n)^2 =$

8.  $\sum_{k=2}^5 (k-1)(k+3) =$

Use the summation notation to write the given sums.

9.  $\frac{5}{1+1} + \frac{5}{1+2} + \frac{5}{1+3} + \dots + \frac{5}{1+15} =$

11.  $1+3+5+7+9 =$

10.  $4(1)+4(2)+4(3)+\dots+4(9) =$

12.  $2+2+2+2 =$

## Sigma Notation – Quiz

### PATTERNS DAY 11

1.  $\sum_{n=12}^{15} (2n + 2)$  represents the expression  $(2 \cdot 12 + 2) + (2 \cdot 13 + 2) + (2 \cdot 14 + 2) + (2 \cdot 15 + 2)$

The number 12 is called the \_\_\_\_\_, the number 15 is called the \_\_\_\_\_ and the expression  $2n + 2$  is called the \_\_\_\_\_.

2. Write out each of these summation problems as a string of numbers added together.

a)  $\sum_{i=0}^4 3i^2 =$

b)  $\sum_{k=3}^8 \frac{1}{k} =$

c)  $\sum_{n=1}^3 10k =$

3. Use the summation notation to write the given sums.

a)  $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6} =$

b)  $10 + 17 + 26 + 37 =$

**SIGNED NUMBERS PRE-TEST: NO CALCULATORS ALLOWED.**

1.  $-8 + 2 = \underline{\hspace{2cm}}$

2.  $-4 + 9 = \underline{\hspace{2cm}}$

3.  $-3 + -4 = \underline{\hspace{2cm}}$

4.  $10 + (-6) = \underline{\hspace{2cm}}$

5.  $5 - (-3) = \underline{\hspace{2cm}}$

6.  $4 - 10 = \underline{\hspace{2cm}}$

7.  $0 - 5 = \underline{\hspace{2cm}}$

8.  $-2 - (-6) = \underline{\hspace{2cm}}$

9.  $3(-4) = \underline{\hspace{2cm}}$

10.  $-5(2) = \underline{\hspace{2cm}}$

11.  $-6(-3) = \underline{\hspace{2cm}}$

12.  $(-2)(4)(0) = \underline{\hspace{2cm}}$

13.  $-15 \div 5 = \underline{\hspace{2cm}}$

14.  $-3 \div 12 = \underline{\hspace{2cm}}$

15.  $-24 \div (-3) = \underline{\hspace{2cm}}$

16.  $20 \div (-2) = \underline{\hspace{2cm}}$

**SIGNED NUMBERS POST-TEST: NO CALCULATORS ALLOWED.**

1.  $5 + (-8) = \underline{\hspace{2cm}}$

2.  $-4 + (-2) = \underline{\hspace{2cm}}$

3.  $9 + (-5) = \underline{\hspace{2cm}}$

4.  $7 - (-3) = \underline{\hspace{2cm}}$

5.  $-10 - (-2) = \underline{\hspace{2cm}}$

6.  $4 - 10 = \underline{\hspace{2cm}}$

7.  $0 - (-9) = \underline{\hspace{2cm}}$

8.  $-8(-2) = \underline{\hspace{2cm}}$

9.  $5(-3) = \underline{\hspace{2cm}}$

10.  $16 \div (-2) = \underline{\hspace{2cm}}$

Give the answer, then explain using hot and cold cubes.

11.  $-5 + (-4) = \underline{\hspace{2cm}}$  \_\_\_\_\_

12.  $-3 - (-7) = \underline{\hspace{2cm}}$  \_\_\_\_\_

13.  $-4(5) = \underline{\hspace{2cm}}$  \_\_\_\_\_

Write as an expression and give the resulting temperature change.

14. Three cold cubes are removed and seven hot cubes are added. \_\_\_\_\_

15. Two bunches of five cold cubes are added. \_\_\_\_\_

## SIGNED NUMBERS AFTER DAY 14

Express each expression in terms of hot and cold cubes and then evaluate.

1.  $2 + (-10) =$  \_\_\_\_\_

2.  $-4 + (-8) =$  \_\_\_\_\_

3.  $-3 - (-12) =$  \_\_\_\_\_

4.  $-2(-10) =$  \_\_\_\_\_

Write a numerical expression and give the resultant temperature change.

5. Six cold cubes are added and then ten hot cubes are added. \_\_\_\_\_

6. Two hot cubes are added and then eight hot cubes removed. \_\_\_\_\_

7. Five bunches of four cold cubes are added. \_\_\_\_\_

8. Three bunches of ten cold cubes are removed. \_\_\_\_\_

9. Nine cold cubes added and then twelve hot cubes removed. \_\_\_\_\_

Evaluate the expressions.

10.  $-3 + (-7) =$  \_\_\_\_\_

11.  $15 + (-5) =$  \_\_\_\_\_

12.  $4 - 9 =$  \_\_\_\_\_

13.  $-8 - (-10) =$  \_\_\_\_\_

14.  $0 - 5 =$  \_\_\_\_\_

15.  $(-2)(-6) =$  \_\_\_\_\_

16.  $4(-4) =$  \_\_\_\_\_

17.  $-7(3) =$  \_\_\_\_\_

18.  $-15 \div (-3) =$  \_\_\_\_\_

19.  $-4 \div 20 =$  \_\_\_\_\_

20.  $24 \div (-2) =$  \_\_\_\_\_

21.  $12 - (-6) =$  \_\_\_\_\_

22.  $-9 + 15 =$  \_\_\_\_\_

23.  $-10 - (-3) =$  \_\_\_\_\_

24.  $-5(-4)(0)(-3) =$  \_\_\_\_\_

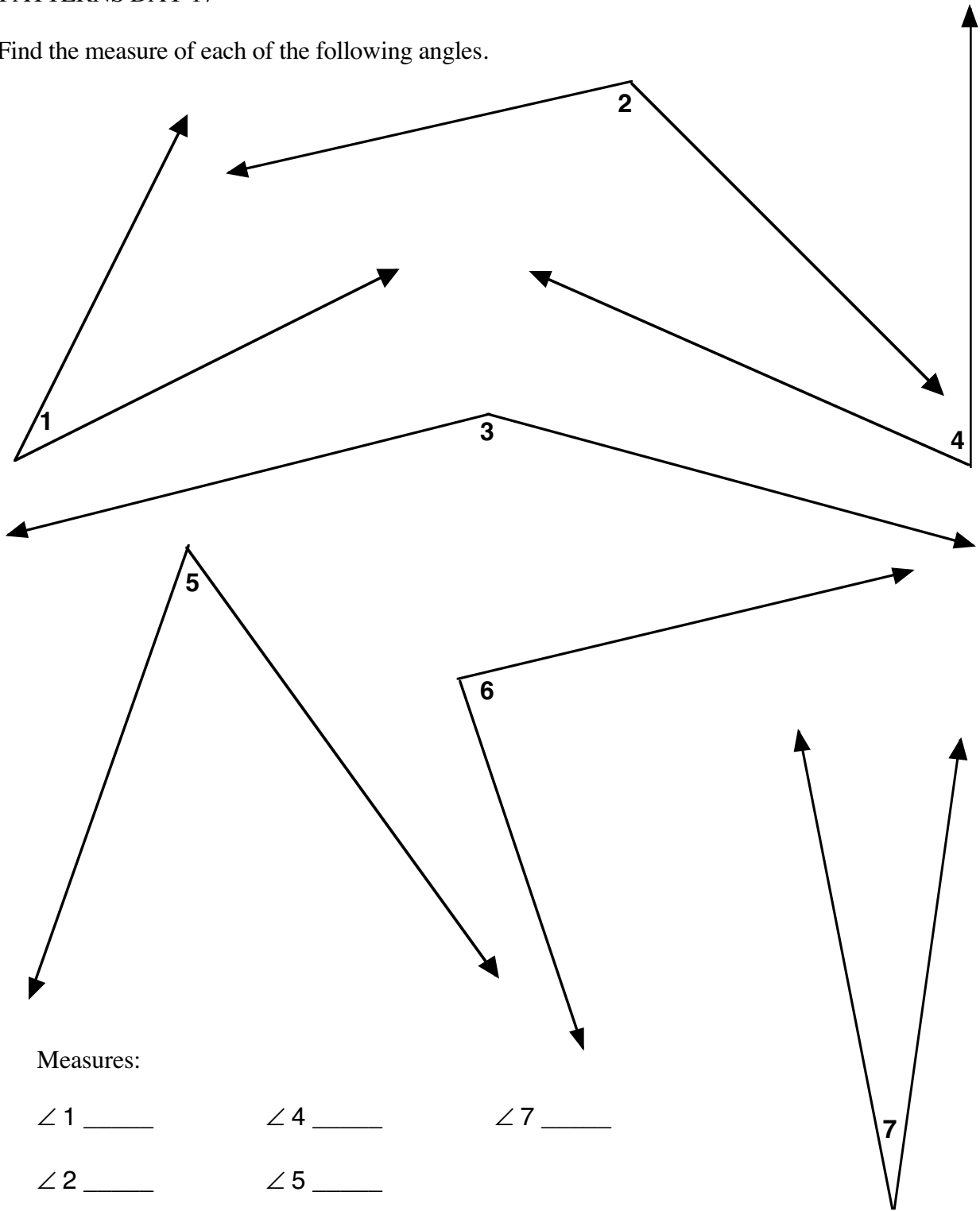
25.  $0 - (-8) =$  \_\_\_\_\_

26.  $-24 \div (-3) \div (-2) =$  \_\_\_\_\_



PATTERNS DAY 17

Find the measure of each of the following angles.



Measures:

$\angle 1$  \_\_\_\_\_

$\angle 4$  \_\_\_\_\_

$\angle 7$  \_\_\_\_\_

$\angle 2$  \_\_\_\_\_

$\angle 5$  \_\_\_\_\_

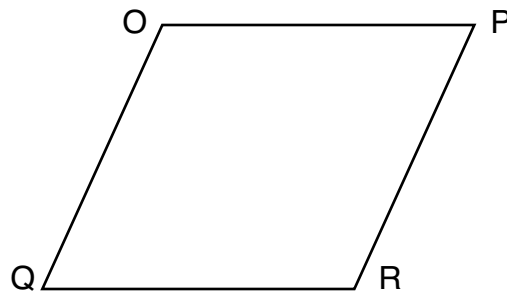
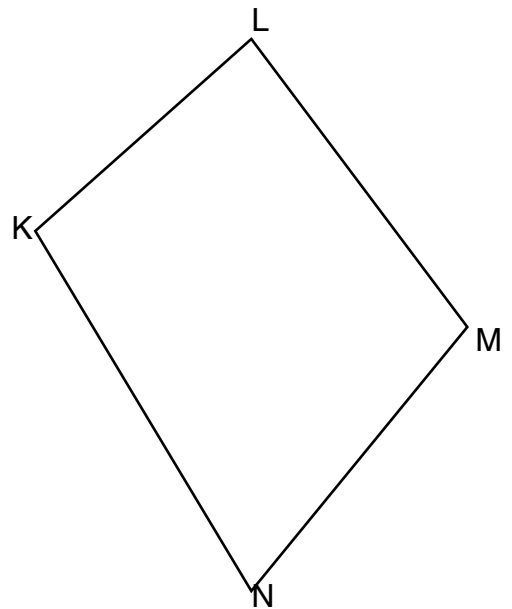
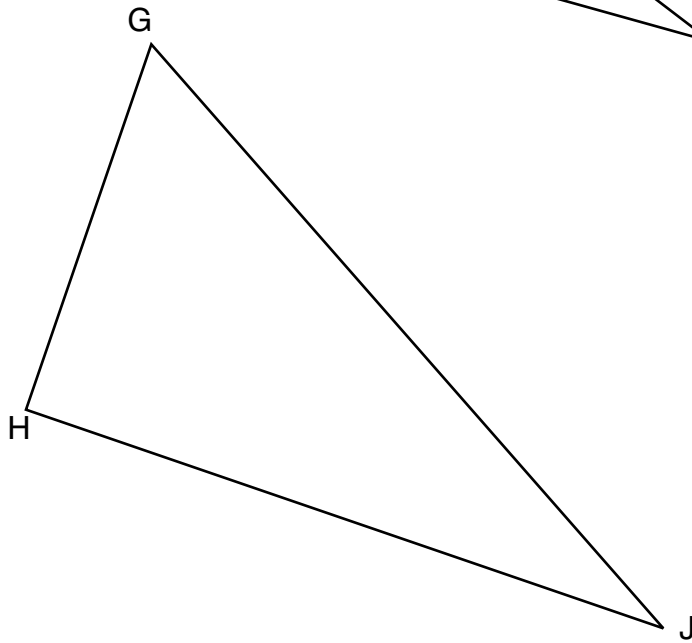
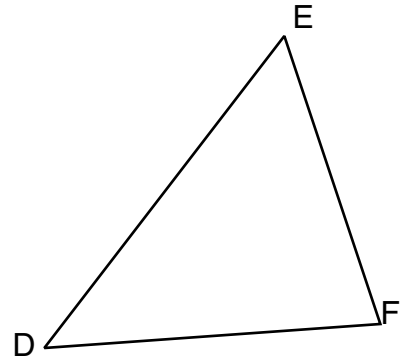
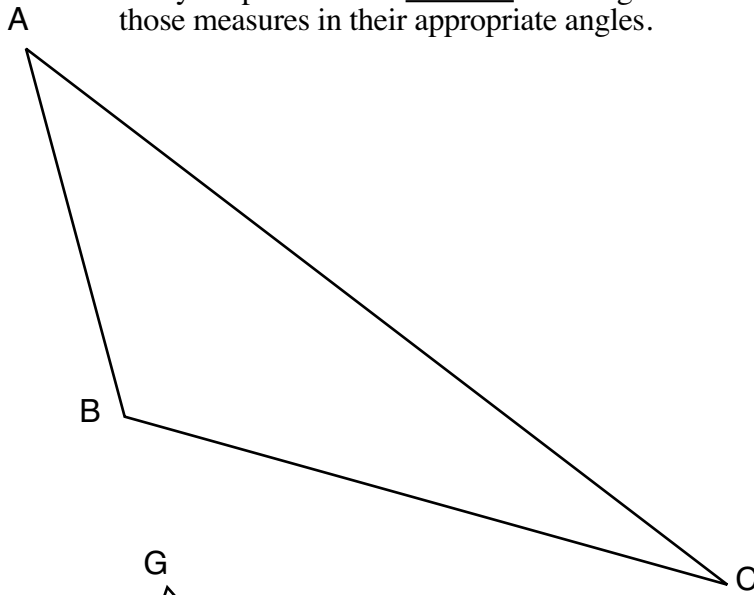
$\angle 3$  \_\_\_\_\_

$\angle 6$  \_\_\_\_\_

Degree Discovery

PATTERNS DAY 18

Use your protractor to Measure each angle of these triangles and Write those measures in their appropriate angles.



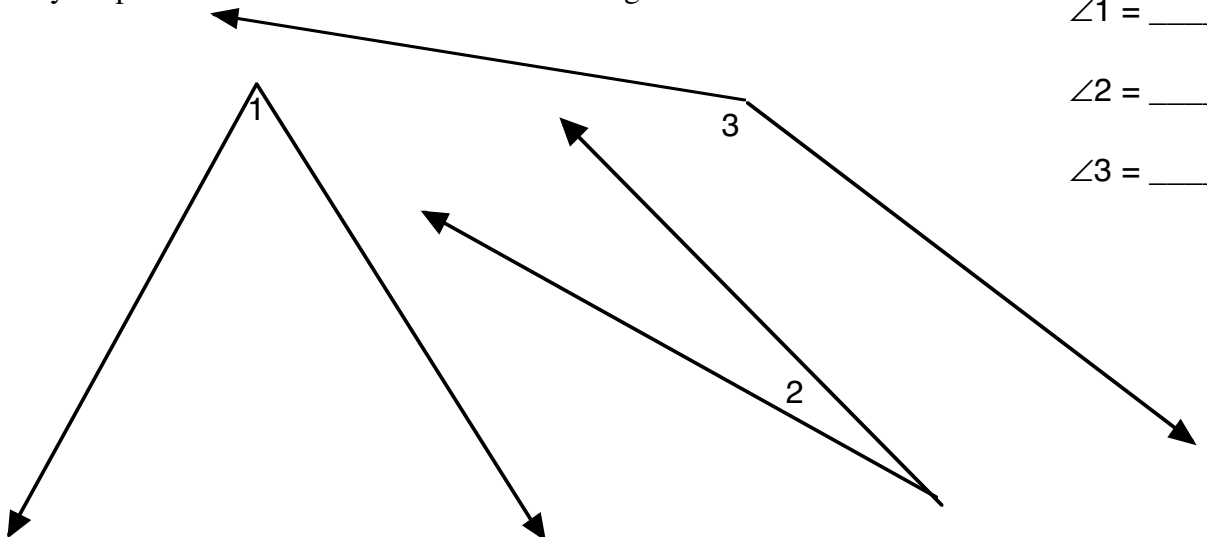
Angle Measurement & Geometric Vocabulary

PATTERNS DAY 19

Match the following:

- |                       |  |
|-----------------------|--|
| a. Obtuse Angle       | 1. ___ A geometric figure formed by two rays with a common vertex.                                   |
| b. Counterclockwise   | 2. ___ A polygon whose sides all have equal length and whose angles all have equal measure.          |
| c. Acute Angle        | 3. ___ Where two lines, segments or rays intersect.  |
| d. Degree             | 4. ___ A portion of a line having a given endpoint and continuing to infinity in only one direction. |
| e. Angle of a Polygon | 5. ___ An angle that measures more than $90^\circ$ and less than $180^\circ$ .                       |
| f. Vertex             | 6. ___ An angle that measures $90^\circ$ .   |
| g. Rays               | 7. ___ An angle that measures more than $0^\circ$ and less than $90^\circ$ .                         |
| h. Protractor         | 8. ___ The measurement unit for an angle defined by having a complete turn equal to $360^\circ$ .    |
| j. Regular Polygon    | 9. ___ The direction in which you must turn to “open” an angle.                                      |
| k. Right Angle        | 10. ___ The instrument calibrated to measure an angle.   |
| l. Angle              |  |

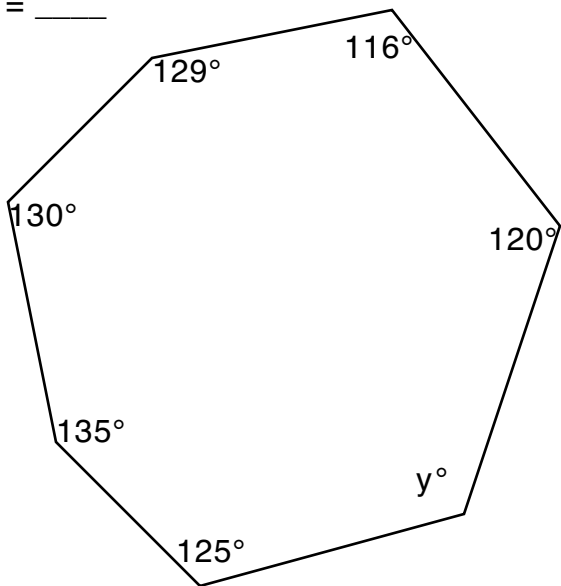
Use your protractor to find the measure of each angle.



Regular Polygons-Each Angle & Angle Sum Quiz  
PATTERNS DAY 22

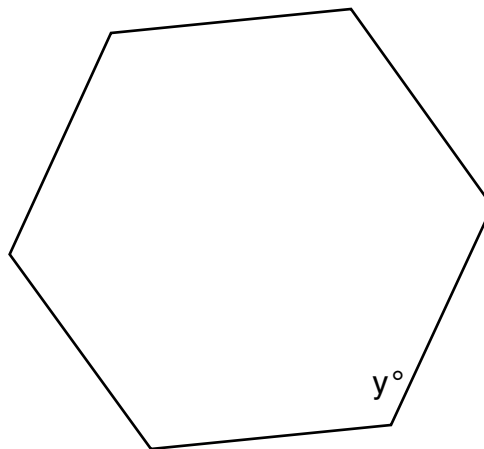
Find the value of  $y^\circ$  in each of the following:

$y =$  \_\_\_\_\_



Below is a REGULAR POLYGON

$y =$  \_\_\_\_\_



For a REGULAR Pentagon find:

- a) The SUM of all the angles. \_\_\_\_\_
- b) The measure of any SINGLE angle. \_\_\_\_\_

## PATTERNS

### SUPPLEMENT TO IN-CLASS ASSESSMENT

4. Evaluate the expression:  $25 - 3 \cdot 2^2 + 5$

5. A six-sided polygon has angles measuring  $89^\circ$ ,  $123^\circ$ ,  $141^\circ$ ,  $96^\circ$ , and  $138^\circ$ . What is the measure of the sixth angle? Show how you get your answer.

6. Write as a string of numbers added together and find the sum.

$$\sum_{i=0}^5 (2i + 1)^2$$

7. A REGULAR polygon has 15 sides.

a. What is the sum of the interior angle measures? Explain how you got your answer.

b. What is the measure of each interior angle?