

## Ohio Achievement Tests – 4<sup>th</sup> Grade Math

### Patterns, Functions, and Algebra Standard

1. Courtney starts with 12 birdhouses. She makes three new birdhouses each week.

Which pattern shows the number of birdhouses Courtney has at the end of each week?

- ☐ A. 3, 6, 9, 12
- ☐ B. 3, 15, 27, 39
- ☐ C. 12, 15, 18, 21
- ☐ D. 12, 24, 36, 48
2. Lyn and Kris were picking up pine cones. Every 15 minutes they counted to check the total number of pine cones they had picked up. The chart shows their results.

Time	Lyn's Pine Cones	Kris' Pine Cones
1:15 p.m.	8	16
1:30 p.m.	15	30
1:45 p.m.	22	44
2:00 p.m.	31	62

Which statement is true according to the data in the chart?

- ☐ A. Kris always picked up 8 more pine cones than Lyn.
- ☐ B. Kris and Lyn picked up the same number of pine cones every 15 minutes.
- ☐ C. Kris picked up fewer pine cones than Lyn.
- ☐ D. Kris picked up twice as many pine cones as Lyn.

3. Mai Lee is buying notebooks. The first notebook costs \$0.78 and each additional notebook costs \$0.22.

Which table shows the cost of the notebooks?

☐ A.

Number of Notebooks	Cost
1	\$0.22
2	\$0.44
3	\$0.66
4	\$0.88
5	\$1.10

☐ B.

Number of Notebooks	Cost
1	\$0.78
2	\$1.00
3	\$1.22
4	\$1.44
5	\$1.66

☐ C.

Number of Notebooks	Cost
1	\$0.78
2	\$1.56
3	\$2.34
4	\$3.12
5	\$3.90

☐ D.

Number of Notebooks	Cost
1	\$1.00
2	\$1.22
3	\$1.44
4	\$1.66
5	\$1.88

4. A theater has 14 rows of seats. Each row has the same number of seats. The theater has a total of 168 seats.

Which equation can be used to find the number of seats,  $s$ , in each row?

- ☐ A.  $168 \times 14 = s$
- ☐ B.  $14 \times s = 168$
- ☐ C.  $168 - s = 14$
- ☐ D.  $14 + s = 168$

5. Casey made the pattern shown.

8, 19, 30, 41, \_\_\_\_, \_\_\_\_, \_\_\_\_

What are the next three numbers?

Describe the pattern.

5. Alice has 12 markers. Ben has half as many markers as Alice.  $M$  is the number of markers that Ben has.

Which equation can Ben use to find the number of markers that he has?

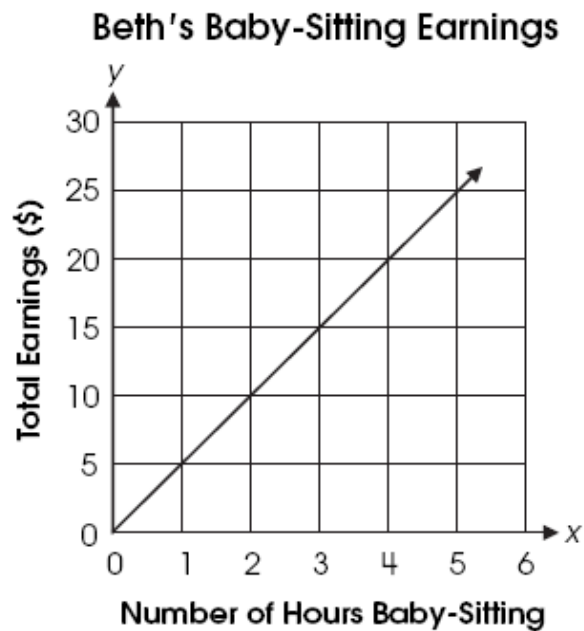
- ☐ A.  $12 \div 2 = M$
- ☐ B.  $12 + 2 = M$
- ☐ C.  $12 \times 2 = M$
- ☐ D.  $12 - 2 = M$

6. Susan saved 50 bottle caps for her school. She plans to save 2 more bottle caps each week.

Which expression tells the total number of bottle caps Susan saves after  $w$  weeks?

- ☐ A.  $50 + 2w$
- ☐ B.  $50 + 2 + w$
- ☐ C.  $50w + 2$
- ☐ D.  $50w + 2w$

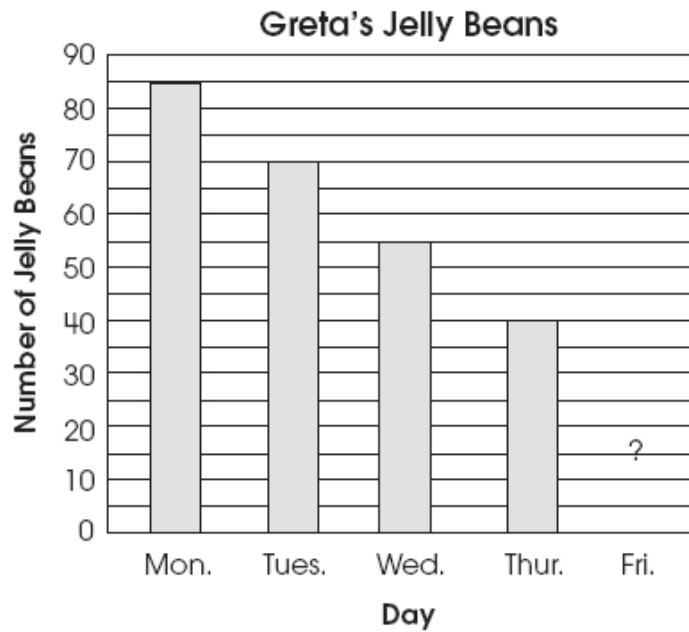
7. The graph shows Beth's earnings while baby-sitting.



Which statement describes how Beth's total earnings change as the number of hours of baby-sitting increases?

- ☐ A. For every hour, the amount she earns doubles.
- ☐ B. For every five hours, the amount she earns increases by \$1.
- ☐ C. For every five hours, the amount she earns increases by \$10.
- ☐ D. For every hour, the amount she earns increases by \$5.

8. The bar graph shows the total number of jelly beans that Greta has each day. The pattern for the number of jelly beans will continue.



How many jelly beans will Greta have on Friday?

- ☐ A. 15
- ☐ B. 25
- ☐ C. 30
- ☐ D. 35

9. A bakery offers a special deal when buying muffins. The table shows how the price per muffin changes.

**Muffin Prices**

Number of Muffins	Price per Muffin
6	\$1.00
12	\$0.75
18	\$0.60
24	\$0.50

Which describes how the price per muffin changes as the number of muffins bought increases?

- ☐ A. For every 6 muffins bought, the price per muffin decreases by \$0.25.
- ☐ B. For every 6 muffins bought, the price per muffin is halved.
- ☐ C. For every 6 muffins bought, the price per muffin decreases.
- ☐ D. For every 6 muffins bought, the price per muffin increases.

10. Riley is making a pattern with numbers.

3, 12, 21, 30

What is the rule for this pattern?

- ☐ A. add 3
- ☐ B. multiply by 4
- ☐ C. add 9
- ☐ D. multiply by 10

11. Kim is making cookies. She puts 3 raisins on each cookie.

How many raisins does she need to make 15 cookies? \_\_\_\_\_

Now, write an expression that tells the number of raisins Kim needs to make any number of cookies. Use  $n$  to represent the number of cookies.



12. Anthony's family plants 15 trees each weekend.

Construct a table showing the total number of trees Anthony's family planted after 1, 2, 3, 4, and 5 weekends.

Describe the pattern that tells the number of trees that the family has planted.

13. Scott added seven to a number, and the answer was less than 12.

Which inequality represents this situation?

- ☐ A.  $12 - 7 < \boxed{?}$
- ☐ B.  $\boxed{?} + 12 < 7$
- ☐ C.  $\boxed{?} - 7 < 12$
- ☐ D.  $\boxed{?} + 7 < 12$

14. Matt recorded the total number of pennies he has saved at the end of each week in the table shown.

Week	Number of Pennies
1	3
2	?
3	12
4	?
5	48

Each week, Matt doubles the number of pennies he has saved. He forgot to record the total number of pennies in week 2 and week 4.

Which completed table shows the correct number of pennies for weeks 2 and 4?

☐ A.

Week	Number of Pennies
1	3
2	6
3	12
4	18
5	48

☐ B.

Week	Number of Pennies
1	3
2	6
3	12
4	24
5	48

☐ C.

Week	Number of Pennies
1	3
2	6
3	12
4	12
5	48

☐ D.

Week	Number of Pennies
1	3
2	5
3	12
4	14
5	48