

Picking Numbers

Problems involving variables on the New York State mathematics test can be challenging because it is abstract. To make abstract questions like these more concrete, try using the Picking Numbers strategy. To do this, you should:

- ▶ Pick numbers to stand for unknown values or variables.
- ▶ Compute the answer using the numbers you picked
- ▶ Select the answer choice that matches your result.

Try It Out!

A school sends s students and t teachers on a field trip. The admission for each student is \$4 and the admission for each teacher is \$6. If the school pays for all students and teachers to participate in the field trip, which expression represents the total amount the school spent?

- A** $(4 + 6)(s + t)$
- B** $4(s + t) + 6(s + t)$
- C** $4s + 6t$
- D** $6s + 4t$

- ▶ Pick a number to represent s , the number of students. Try $s = 5$.
- ▶ Pick a number to represent t , the number of teachers. Try $t = 2$.
- ▶ Compute the total cost of the trip using those numbers.
5 teacher tickets for \$4 each is _____.
2 student tickets for \$6 each is _____
The total cost is the sum of those values: _____.

- ▶ Substitute the numbers you picked into each answer choice.

- A** $(4 + 6)(s + t) = (4 + 6)(5 + 2) = (10)(7) =$ _____
- B** $4(s + t) + 6(s + t) = 4(5 + 2) + 6(5 + 2) =$ _____
- C** $4s + 6t =$ _____
- D** $6s + 4t =$ _____

- ▶ Which choice matches the total cost you found? _____

Make it Easy

When picking numbers, it is more important to choose numbers that are easy to work with than numbers which are realistic.

Backsolving to Solve equations

An **equation** is a mathematical sentence with an equal (=) sign. Backsolving is particularly useful on multiple-choice problems that require you to solve an equation.

Try It Out!

Use Backsolving to solve the following problem.

In the equation below, which value for x will make this statement true?

$$2(x + 5) - 3 = 11$$

- F** -1
- G** 1
- H** 2
- J** 7

▶ Choose an answer choice to try first. Begin with Choice G.

G Substitute 1 for x and evaluate.

$$2(x + 5) - 3 = \underline{\hspace{10em}}$$

Does the expression equal 11?

Which answer choice should you try next?

▶ Substitute the next value for x .

$$2(x + 5) - 3 = \underline{\hspace{10em}}$$

Does the expression equal 11?

▶ Is it necessary to try another answer choice? Why or why not?

Higher or Lower?

In some equations it may be difficult to tell whether to try a higher or lower number when Backsolving. In those cases, try each answer choice until you find one that works.



STEP 1 What is the question asking?



STEP 2 Where is the important information located?



STEP 3 Which math strategies can used to solve this problem?



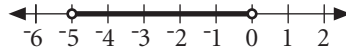
STEP 4 Solve and check.

Read Carefully

Questions that require you to continue a pattern will not always ask for the next number in the pattern, they may ask for the number after the next number.

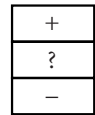
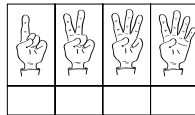
Independent Practice

- 1** Which equation represents the solution shown by the number line below?



- A** $-5 < x \leq 0$
B $-5 \leq x \leq 0$
C $-5 < x < 0$
D $0 > x > 5$

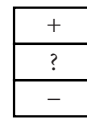
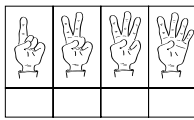
HINT Which answers choices can you eliminate immediately?



2 On a trip to the movies, the Jensen family bought s sodas for \$1.50 each and c candy bars for \$2.00 each. Which equation represents the total amount in dollars that they spent on soda and candy bars?

- F** $1.50s + 2c$
- G** $1.50c + 2s$
- H** $3.5(c + s)$
- J** $s + c + 3.50$

HINT Pick numbers for s and c and use those numbers to solve the problem.

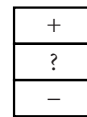
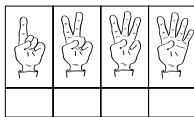


3 What is the next number in this sequence.

810, 270, 60, 30, ___?

- A** 3
- B** 9
- C** 10
- D** 15

HINT Since the numbers are decreasing, look for a subtraction or a division pattern.



4 Annie organizes bags of marbles. Each bag has 5 red marbles and 4 blue marbles. If she makes 15 bags, which expression tells how many marbles she uses altogether?

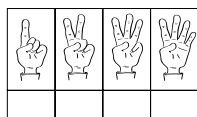
F $15 \times 5 + 15 \times 4$

G $15 \times 5 + 4$

H $15 + 5 \times 4$

J $15(5 + 4)$

HINT Compute the number of marbles she needs. Which answer choice equals that amount?



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5 In the equation below, which value for x will make this statement true?

$$3x - (x - 6) = 22$$

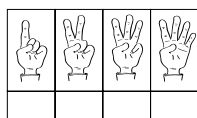
A 4

B 7

C 8

D 14

HINT Try Backsolving. Start with Choice B.



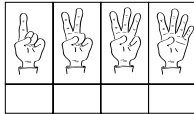
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4 Kendra examines the expression below.

$$5(x - 1) + 3x$$

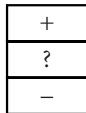
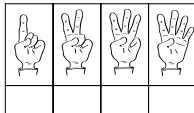
What number should he use for x if she wants this expression to equal 19?

- F** 3
- G** 5
- H** 6
- J** 8

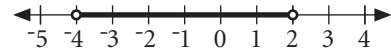


5 Ashlee worked five more hours this week than last week. If l equaled the number of hours she worked last week and t equals the number of hours she worked this week, which equation below describes the relationship between l and t ?

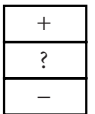
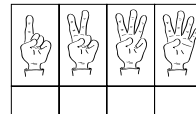
- A** $l - 5 = t$
- B** $t = l - 5$
- C** $t + l = 5$
- D** $l = t + 5$



6 Which inequality represents the solution shown by this number line?



- F** $-4 < x < 2$
- G** $-4 < x \leq 2$
- H** $-4 \leq x < 2$
- J** $4 \leq x \leq 2$



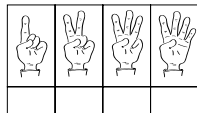
7 Every year Geraldine’s rent increases. Her rent for the past four years is shown in the chart.

GERALD’S RENT

| Year | Rent |
|------|-------|
| 2001 | \$600 |
| 2002 | \$625 |
| 2003 | \$650 |

If Geraldine’s rent continues to increase according to the same pattern, what will be her rent in 2007!

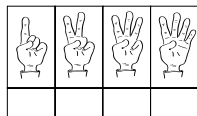
- A** \$675
- B** \$725
- C** \$750
- D** \$800



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8 The length of a rectangle is eight centimeters longer than the width. If the area of the rectangle is 48 square centimeters, which equation can be used to find the width of the rectangle?

- A** $2w + 2(w + 8) = 48$
- B** $w + w + 8 = 48$
- C** $w(w + 8) = 48$
- D** $w + 8 = 48$



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