



# Are you ready for Beast Academy 2C?



Before beginning Beast Academy 2C, students should understand the basics of addition and subtraction, parentheses, symbols that stand for numbers, and simple equations.

Students should also know how to guess-and-check, work backwards, and draw pictures to solve challenging problems.

A student ready for Beast Academy 2C should be able to answer at least 12 of the 16 problems below correctly.

**Step 1.** The student should try to answer every question without a calculator and without help.

**Step 2.** Check the student's answers using the solutions at the end of this document.

**Step 3.** The student should be given a second chance on problems answered incorrectly.

**Evaluate each expression below.**

1.  $87 - 35 = \underline{\quad}$       2.  $975 - 444 = \underline{\quad}$       3.  $555 - 99 = \underline{\quad}$

4.  $431 - 350 = \underline{\quad}$       5.  $131 - 84 - 16 = \underline{\quad}$       6.  $232 - 75 - 32 = \underline{\quad}$

**Solve each problem below.**

7. What is  $45 - (12 + 3)$ ?      7.  $\underline{\quad}$

8. Place one pair of parentheses in the equation below to make it true.

$$16 - 8 - 4 - 2 = 14$$

9. Fill each blank below with + or - to make the equation true.

$$45 \square 7 \square 2 \square 8 = 44$$



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*Solve each problem below.*

10. Evaluate the expression below when  $\text{☾} = 9$  and  $\text{◯} = 13$ .

$$\text{◯} + \text{◯} - 5 - \text{☾} = \underline{\hspace{2cm}}$$

11. Pip makes  $\star$  cookies. Burt makes twice as many cookies as Pip. Circle the expression below that gives the *total* number of cookies Pip and Burt make.

$\star + 2$

$\star + 3$

$\star + \star$

$\star + \star + 2$

$\star + \star + \star$

*Find the value of the symbol in each equation below.*

12.  $\text{♣} + 12 = 35$

13.  $\text{✦} + \text{✦} - 1 = 15$

$\text{♣} = \underline{\hspace{2cm}}$

$\text{✦} = \underline{\hspace{2cm}}$

*Solve each problem below.*

14. One hundred monsters stand in a line. Arg is 15<sup>th</sup> in line. Burg is 25<sup>th</sup> in line. How many monsters are between Arg and Burg? **14.**

15. Each day, the number of leaves on a Magic Bush doubles. On Friday, a Magic Bush had 96 leaves. How many leaves did the Magic Bush have on Monday, earlier that week? **15.**

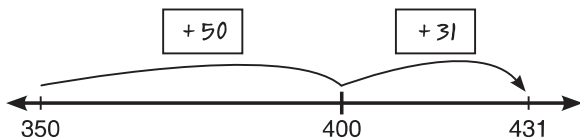
16. Matt has 3 more pennies than Kim. Together, they have 29 pennies. How many pennies does Kim have? **16.**



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## Solutions

- We subtract by place value.  
8 tens minus 3 tens is 5 tens.  
7 ones minus 5 ones is 2 ones.  
5 tens and 2 ones is 52. So,  $87 - 35 = 52$ .
- We subtract by place value.  
9 hundreds minus 4 hundreds is 5 hundreds.  
7 tens minus 4 tens is 3 tens.  
5 ones minus 4 ones is 1 one.  
5 hundreds, 3 tens, and 1 one is 531.  
So,  $975 - 444 = 531$ .
- Subtracting 99 is the same as subtracting 100, then adding 1.  
So,  $555 - 99$  is the same as  $555 - 100 + 1 = 455 + 1 = 456$ .
- To subtract  $431 - 350$ , we can count up.  
400 is 50 more than 350.  
431 is 31 more than 400.



- So, 431 is  $50 + 31 = 81$  more than 350.  
This means that  $431 - 350 = 81$ .
- Subtracting 84, then subtracting 16 more is the same as subtracting  $84 + 16 = 100$  all at once. So, we have  
 $131 - 84 - 16 = 131 - 100 = 31$ .
  - Subtracting 75, then subtracting 32 is the same as subtracting 32, then subtracting 75. So, we have  
 $232 - 75 - 32 = 232 - 32 - 75 = 200 - 75 = 125$ .
  - We evaluate what's in parentheses first.  
So,  $45 - (12 + 3) = 45 - 15 = 30$ .
  - We place the parentheses as shown below to make a true equation.  
 $16 - (8 - 4 - 2) = 14$
  - Starting with 45, we must subtract 1 more than we add to get 44. Subtracting 7 then subtracting 2 subtracts a total of 9, which is 1 more than 8.  
So, we subtract 7 and 2, and add 8.  
 $45 - 7 - 2 + 8 = 44$
  - We replace the  $\ominus$  with 9 and each  $\odot$  with 13. Then, we evaluate the expression as shown below.  
 $\odot + \odot - 5 - \ominus = 13 + 13 - 5 - 9 = 26 - 5 - 9 = 21 - 9 = 12$ .

- Pip makes  $\star$  cookies. Since Burt makes twice as many cookies as Pip, Burt makes  $\star + \star$  cookies.  
So, Pip and Burt make  $\star + \star + \star$  cookies all together.  
 $\star + 2 \quad \star + 3 \quad \star + \star \quad \star + \star + 2 \quad \textcircled{\star + \star + \star}$
- Since  $23 + 12 = 35$ , we have  $\clubsuit = 23$ .
- We subtract 1 from  $\spadesuit + \spadesuit$  to get 15. So,  $\spadesuit + \spadesuit$  is 1 more than 15, which is 16. Since  $8 + 8 = 16$ , we have  $\spadesuit = 8$ .  
We replace  $\spadesuit$  with 8 to check our answer:  $8 + 8 - 1 = 15$ . ✓
- To find the number of monsters between Arg and Burg, we draw a "picture" of monsters 15 to 25 and circle the monsters between Arg and Burg.



- All together, we count **9** monsters between Arg and Burg.
- We work backwards. On Friday, the Magic Bush had 96 leaves, which is twice as many leaves as it had the day before.  
Since  $48 + 48 = 96$ , the Magic Bush had 48 leaves on Thursday.  
Since  $24 + 24 = 48$ , the Magic Bush had 24 leaves on Wednesday.  
Since  $12 + 12 = 24$ , the Magic Bush had 12 leaves on Tuesday.  
Since  $6 + 6 = 12$ , the Magic Bush had **6** leaves on Monday.
  - We guess the number of pennies Kim has, then check the result.  
If Kim has 10 pennies, then Matt has  $10 + 3 = 13$  pennies, and together they have  $10 + 13 = 23$  pennies. Not enough!  
If Kim has 15 pennies, then Matt has  $15 + 3 = 18$  pennies, and together they have  $15 + 18 = 31$  pennies. Too many!  
If Kim has 13 pennies, then Matt has  $13 + 3 = 16$  pennies, and together they have  $13 + 16 = 29$  pennies. Got it!  
So, Kim has **13** pennies.