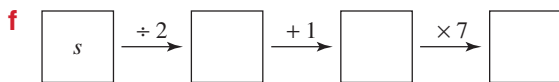
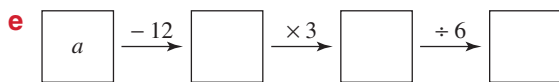
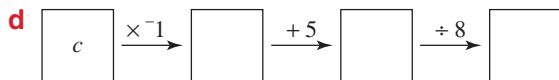
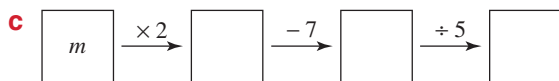
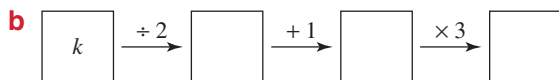


## EXERCISE 5A

Now try these

- Explain why flow charts are helpful when building algebraic expressions.
- Build an expression by following the instructions on each of the following flow charts.



- Use a flow chart to build the following information into an expression.

- Start with  $y$ . Add 15 and divide by 10.
- Start with  $r$ . Divide by 4, subtract 1 and multiply by 2.
- Start with  $f$ . Divide by 8, subtract 1 and multiply by 8.
- Start with  $e$ . Multiply by 11, subtract 100 and divide by 3.

- When building each of the following expressions, what is the first operation performed on the pronumeral?

- |                         |                         |                     |
|-------------------------|-------------------------|---------------------|
| a $\frac{2w+8}{7}$      | b $\frac{3(4d+16)}{27}$ | c $-v+7$            |
| d $19(2p+\frac{7}{11})$ | e $y^2+7$               | f $\frac{k^3+7}{4}$ |

- What is the last operation performed on the pronumeral in each of the expressions in question 4?

- EXAMPLE 1** Construct a flow chart for each of the following expressions to show how the expressions were built.

- |            |                       |                        |                                 |
|------------|-----------------------|------------------------|---------------------------------|
| a $2(x+8)$ | b $-3(n-9)$           | c $\frac{p}{5}-3$      | d $\frac{t-3}{5}$               |
| e $-r+18$  | f $\frac{3(s-15)}{7}$ | g $4(\frac{2w}{7}-29)$ | h $\frac{1}{2}(\frac{5y}{7}+3)$ |

- EXAMPLE 2** Evaluate each of the expressions in question 6 for each of the following values.

- |         |          |          |          |
|---------|----------|----------|----------|
| a $x=2$ | b $n=10$ | c $p=15$ | d $t=23$ |
| e $r=5$ | f $s=22$ | g $w=14$ | h $y=3$  |

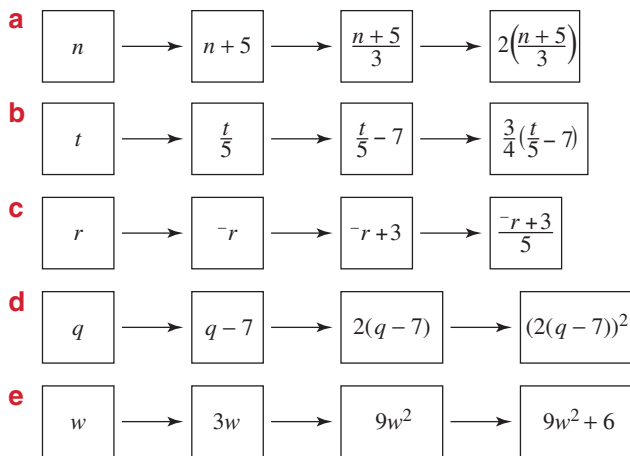
**Digital docs:**

**Activity 5-1**  
Building expressions

**Activity 5-2**  
Building more  
expressions

**Activity 5-3**  
Building advanced  
expressions

8 Fill in the missing operations on the following flow charts.



9 Translate the following problems into flow charts using letters and numbers.

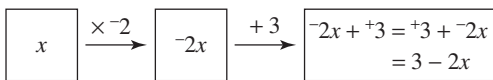
- a A classmate had some money for lunch and was then given \$6. He then gave half of his money to a friend, and afterwards lost \$2 down the drain.
- b A friend is collecting bottle caps. In a week, she doubles her collection, but then gives five to you. Later, her uncle gives her another 10, but then she has to give half of her collection to her younger brother.
- c You have a number of balloons for a party. When blowing them up, five of them burst. You try to return them to the shop, but instead they double the number you already have. When you blow these up, only three burst.

- 10 a Write your own short story involving numbers and build an expression using a flow chart.
- b Swap your flow chart with a classmate's and see if you can think of a story for their flow chart.

**Going further**

**Subtracting pronumerals**

When building expressions where the pronumeral is subtracted from another number, it is necessary to use directed numbers to build the expression. For example,  $3 - 2x$  is built like this:



Draw flow charts to show how the following expressions can be built.

- 1  $18 - 5w$
- 2  $\frac{51 - 3c}{7}$
- 3  $9 - \frac{2b + 3}{5}$

**Extension**

Some problems start with the sentence 'Think of a number ...', and after following their instructions you end up with the number you began with. Use flow charts to mathematically create one of these problems. (*Hint:* You need to reverse all operations you perform!)

**REFLECTION**

**WHOLE CLASS**

*What is one important thing to remember when building expressions?*