Note: Students will need a calculator with function for exercise 2.

═══════════ **Exercise 1** ═══════════

EXPONENTS
In Groups

━ **Textbook practice** ━

a. Open your textbook to lesson 50, part 1.
- (Teacher reference:)

10	10	10	10	10	10	10^6
(10	10)	(10	10	10	10)	10^6
10^2			10^4			10^6

10	10	10

6.
So the whole set is 10^6.

c. Below is the same set of 10s in 2 groups. The groups are **multiplied** together. How many 10s are multiplied in the rst group? (Signal.) *2.*
So that group equals 10^2.
- Say the base and exponent for that group. (Signal.) 10^2.
- Look at the next group.
How many 10s are in the second group? (Signal.) *4.*
- Say the base and exponent for that group. (Signal.) 10^4.
So another way to show 10^6 is 10^2 times 10^4.
- What's another way of showing 10^6? (Signal.) 10^2 10^4.
- (Repeat step c until rm.)
d. The next box shows the same set of 10s in different groups.
- How many 10s are in the rst group? (Signal.) *3.*

Say the base and exponent for that group. (Signal.) 10^3.
- How many 10s are in the other group? (Signal.) *3.*
Say the base and the exponent for that group. (Signal.) 10^3.
- So 10^3 10^3 10^6.
- What's another way of showing 10^6? (Signal.) 10^3 10^3.
e. So if the base number is shown 6 times, the exponents must add up to 6.
f. If the base is shown 6 times, what must the exponents add up to? (Signal.) *6.*
- If the base is shown 9 times, what must the exponents add up to? (Signal.) *9.*
- If the base is shown 5 times, what must the exponents add up to? (Signal.) *5.*
- (Repeat step f until rm.)

━ **Textbook practice** ━

a. Find part 2.
- For each item, you'll write the complete equation with exponents.
b. Problem A. The multiplication shows 8 seven times.
- Say the base and exponent for all the 8s. (Signal.) 8^7.
So no matter how the 8s are multiplied together, the exponents must add up to 7.
- You can see the groups set off with parentheses.
- Touch the rst group.
Tell me the base and exponent you'll write for the rst group. (Signal.) 8^2.
- Next group.
Tell me the base and exponent. (Signal.) 8^3.
- Last group.
- Tell me the base and exponent. (Signal.) 8^2.
- The exponents are 2 and 3 and 2. Do the exponents add up to 7? (Signal.) *Yes.*
- So the whole equation is 8^7 8^2 8^3 8^2.
c. Say the equation. (Signal.) 8^7 8^2 8^3 8^2.
- Write that equation. Pencils down when you're nished.

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• (Write on the board:)   50 1.

| a. | 8^7 | 8^2 | 8^3 | 8^2 |

• Here's what you should have.
d. Write the complete equation for problem
   B. Pencils down when you're nished.

j. Work the rest of the problems in part 3.
   Pencils down when you're

- Problem D. How much will the diameter increase? (Signal.) *18 and 2/3 centimeters.*

Exercise 4

MULTIPLYING INTEGERS

— **Textbook practice** —

a. Find part 5.
- These are multiplication problems with signed numbers.
b. Remember the rules for multiplying 2 values.
- If the signs are the same, what is the sign in the answer? (Signal.) *Plus.*
- If the signs are different, what is the sign in the answer? (Signal.) *Minus.*
- (Repeat step b until rm.)
c. Everybody, read problem A. (Signal.) *5 (2.3).*
- Are the signs the same or different? (Signal.) *Same.*
- So what's the sign in the answer? (Signal.) *Plus.*
d. Read problem B. (Signal.) *3/8 (5).*
- Are the signs the same or different? (Signal.) *Different.*
- So what's the sign in the answer? (Signal.) *Minus.*
e. Copy the problems in part 5 and work them.
- Remember, rst gure out the sign in the answer. Then multiply to nd the number part of the answer. Pencils down when you're nished.
  (Observe students and give feedback.)
f. Check your work.
- Problem A: 5 (2.3). What's the answer? (Signal.) *11.5.*
- Problem B: 3/8 (5). What's the answer? (Signal.) *15/8.*
- Problem C: 6.4 (10). What's the answer? (Signal.) *64.*
- Problem D: .4 (2). What's the answer? (Signal.) *.8.*
- Problem E: 7 (1). What's the answer? (Signal.) *7.*
- Problem F: 5/7 (6). What's the answer? (Signal.) *30/7.*

- Problem G: 1 (6). What's the answer? (Signal.) *6.*
- Problem H: 2/3 (7). What's the answer? (Signal.) *14/3.*
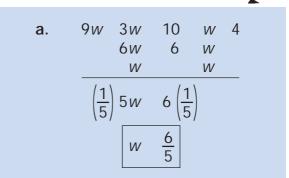

Exercise 5

ALGEBRA
Like Terms on Both Sides

— **Textbook practice** —

a. Find part 6.
b. Problem A: 9W   3W   10   W   4.
- Remember the steps: First, combine like terms on each side. Then add or subtract to get a letter term on 1 side and a number term on the other side. Then solve for the letter. Pencils down when you've nished problem A.
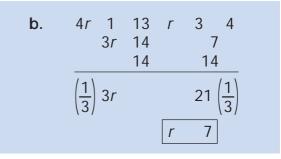 (Observe students and give feedback.)
- (Write on the board:)

a.					
	$9w$	$3w$	10	w	4
		$6w$	6	w	
		w		w	
	$\left(\dfrac{1}{5}\right)5w$		$6\left(\dfrac{1}{5}\right)$		
		$\boxed{w \quad \dfrac{6}{5}}$			

- The equation with combined like terms is 6W   6   W.
- You subtract W from both sides. You get the equation 5W   6. So W   6/5.
c. Problem B: 4R   1   13   R   3   4.
- Combine the like terms. Then solve for R. Pencils down when you're nished.
  (Observe students and give feedback.)
- (Write on the board:)

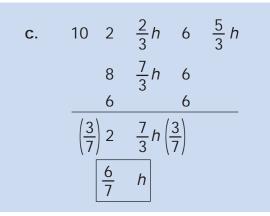| b.					
	$4r$	1	13	r	3	4
		$3r$	14		7
			14		14
	$\left(\dfrac{1}{3}\right)3r$			$21\left(\dfrac{1}{3}\right)$	
		$\boxed{r \quad 7}$			

- Read the equation with combined like terms. (Signal.) *3R   14   7.*
- What do you do to change both sides? (Signal.) *Add 14.*
  So 3R   21.
- What does R equal? (Signal.) *7.*

d. Problem C: 10   2   2 thirds H   6   5 thirds H.

- Combine the like terms. Then ﬁgure out what H equals. Pencils down when you're ﬁnished.
  (Observe students and give feedback.)
- (Write on the board:)   50 5· \

$$
\begin{array}{llll}
\text{c.} & 10\ 2\ \dfrac{2}{3}h\ 6\ \dfrac{5}{3}h \\[2mm]
& \quad\ \ 8\ \dfrac{7}{3}h\ 6 \\[2mm]
& \quad\ \ 6\qquad\ 6 \\[1mm]
\hline \\[-1mm]
& \left(\dfrac{3}{7}\right)2\ \dfrac{7}{3}h\left(\dfrac{3}{7}\right) \\[3mm]
& \boxed{\dfrac{6}{7}\quad h}
\end{array}
$$

- Read the equation with combined like terms. (Signal.) *8   7 thirds H   6.*
- What do you do to change both sides? (Signal.) *Subtract 6.*
- What does H equal? (Signal.) *6/7.*

e. Problem D: 11K   4K   15   2K   5.

- Combine the like terms. Then ﬁgure out what K equals. Pencils down when you're ﬁnished.
  (Observe students and give feedback.)
- (Write on the board:)   50 5 \

$$
\begin{array}{llll}
\text{d.} & 11k\ \ 4k\ \ 15\ \ 2k\ \ 5 \\
& \quad\ \ 7k\ \ 10\ \ 2k \\
& \quad\ \ 2k\qquad\ 2k \\
\hline \\[-1mm]
& \left(1 \\[3mm]
& \boxed{}
\end{array}
$$