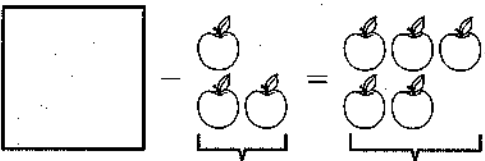
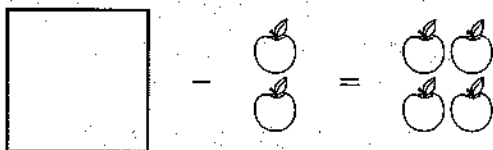
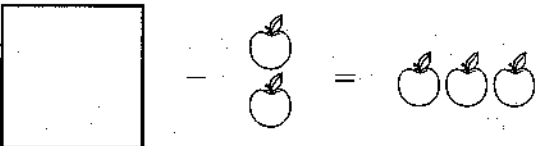


4. Tim took some apples from a box. Show how many apples were in the box originally.

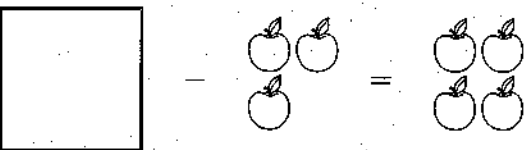
a) 
 Tim took away this many. This is how many were left.

b) 

c) 

d) 

5. Show how many apples were in the box originally. Then finish the equation that represents the picture.

a) 
 $\square - 3 = 4$

b) 
 $\square - 2 = 6$

6. Find the number that makes the equation true and write it in the box.

a) $\square + 4 = 7$

b) $\square + 3 = 6$

c) $\square + 5 = 9$

d) $9 - \square = 6$

e) $17 - \square = 13$

f) $11 - \square = 9$

g) $2 \times \square = 6$

h) $3 \times \square = 15$

i) $3 \times \square = 9$

j) $\square \div 2 = 4$

k) $\square \div 5 = 3$

l) $\square \div 3 = 4$

m) $5 + 4 = 5 + \square$

n) $2 + 4 = \square + 5$

o) $3 + 2 = 8 - \square$

- BONUS ► Put the same number in both boxes to make the equation true.

a) $\square + 2 = 8 - \square$

b) $\square \div 2 = \square - 2$

c) $\square \times \square = 9$

- Find two different answers for the equation. Put the same number in the same shapes.

$\triangle + \triangle + \bigcirc = 5$

$\square + \square + \diamond = 5$

REMINDER ▶ A **variable** is a letter or symbol (such as w , T , or h) that represents a number.

To **solve an equation**, find a number for the variable that makes the equation true.

8. Solve the equation for the given variable.

- a) $x + 2 = 7$, $x = \underline{5}$ b) $x + 6 = 8$, $x = \underline{\quad}$ c) $10 = x + 7$, $x = \underline{\quad}$
d) $x - 1 = 5$, $x = \underline{\quad}$ e) $4 = t - 3$, $t = \underline{\quad}$ f) $2 = 9 - w$, $w = \underline{\quad}$
g) $2 \times H = 8$, $H = \underline{\quad}$ h) $L \times 3 = 15$, $L = \underline{\quad}$ i) $63 = 7 \times m$, $m = \underline{\quad}$
j) $n \div 4 = 2$, $n = \underline{\quad}$ k) $W \div 5 = 3$, $W = \underline{\quad}$ l) $4 = T \div 6$, $T = \underline{\quad}$
m) $x + 3 = 5 + 3$, $x = \underline{\quad}$ n) $10 - 3 = t + 1$, $t = \underline{\quad}$ o) $S - 1 = 4 + 2$, $S = \underline{\quad}$

9. Write an equation with a variable to represent the situation. Solve the equation.

- a) Jayden has 9 hats.
Four of them are plain.
How many have designs on them?
 $\underline{x + 4 = 9, \text{ so } x = 5}$
- b) There are 21 trees in the garden.
13 of them are pear trees.
How many are not pear trees?
 $\underline{\quad}$
- c) There are 100 marbles in a jar.
64 of them are red and the rest are blue.
How many marbles are blue?
 $\underline{\quad}$
- d) Lily saved \$32 in October.
She saved \$75 in October and November.
How much money did she save in November?
 $\underline{\quad}$

10. Solve the equation.

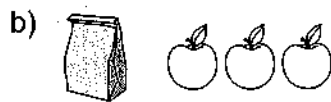
- a) $x + 2 = 3 \times 5$
so $\underline{x + 2 = 15}$
so $\underline{x = 13}$
- b) $x + 5 = 2 \times 7$
so $\underline{x + 5 = \quad}$
so $\underline{x = \quad}$
- c) $4 \times 6 = x + 9$
so $\underline{\quad}$
so $\underline{\quad}$
- d) $x - 3 = 4 \times 2$
so $\underline{\quad}$
so $\underline{\quad}$
- e) $5 \times 6 = x - 7$
so $\underline{\quad}$
so $\underline{\quad}$
- f) $2 \times x = 3 \times 4$
so $\underline{\quad}$
so $\underline{\quad}$
- g) $5 \times 6 = x \times 10$
so $\underline{\quad}$
so $\underline{\quad}$
- h) $x \div 3 = 2 + 5$
so $\underline{\quad}$
so $\underline{\quad}$
- BONUS** ▶ $11 - x = 2 \times 3$
so $\underline{\quad}$
so $\underline{\quad}$

PA6-10 Modelling Equations

1. Each bag contains the same unknown number of apples. Let x stand for the number of apples in one bag. Write a mathematical expression for the total number of apples.



$x + 2$



2. Write an expression for the total number of apples. Write an **equation** by making the expression equal to the total number of apples.

- a) There are **7 apples** in total.



Expression $2x + 1$

Equation $2x + 1 = 7$

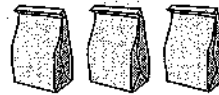
- b) There are **10 apples** in total.



Expression _____

Equation _____

- c) There are **15 apples** in total.

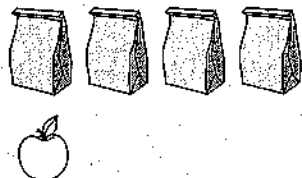


Expression _____

Equation _____

3. Write an equation and find the number of apples in each bag.

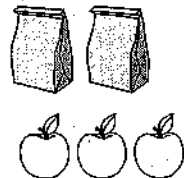
- a) 9 apples in total



Equation $4x + 1 = 9$

2 apples in each bag

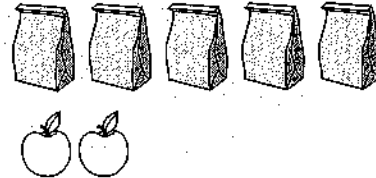
- b) 13 apples in total



Equation _____

_____ apples in each bag

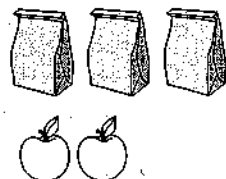
- c) 17 apples in total



Equation _____

_____ apples in each bag

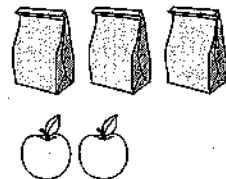
- d) 11 apples in total



Equation _____

_____ apples in each bag

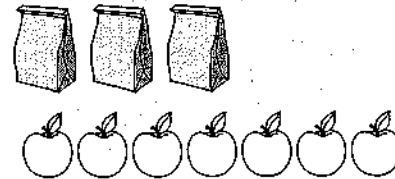
- e) 14 apples in total



Equation _____

_____ apples in each bag

- f) 31 apples in total



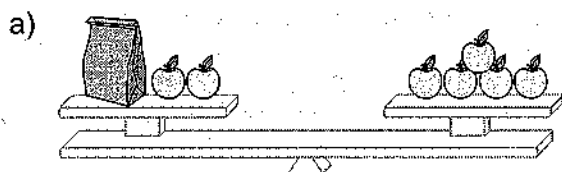
Equation _____

_____ apples in each bag

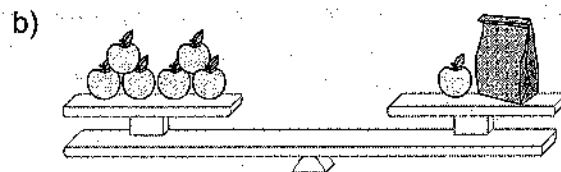
4. Does this type of model work for the equation $3x - 4 = 14$? _____

Explain. _____

5. The scales are balanced. Cross out the same number of apples on each side to find how many apples are in the bag.



There are _____ apples in the bag.



There are _____ apples in the bag.

An equation is like balanced scales. An equal sign between the sides shows that they are equal.

To solve $x + 4 = 10$, subtract 4 from both sides of the equation.

$$x + 4 = 10$$

$$\underline{-4} \quad \underline{-4}$$

$$x = 6$$



6. Subtract 4 from both sides of the equation.

a) $x + 4 = 12$

$$\underline{-4} \quad \underline{-4}$$

$$x = 8$$

b) $x + 4 = 9$

$$\underline{-4} \quad \underline{-4}$$

$$x = \square$$

c) $14 = x + 4$

$$\underline{-4} \quad \underline{-4}$$

$$\square = x$$

d) $56 = x + 4$

$$\underline{-4} \quad \underline{-4}$$

$$\square = x$$

7. Subtract the same number from both sides of the equation.

a) $x + 15 = 32$

$$\underline{-15} \quad \underline{-15}$$

$$x = \square$$

b) $x + 43 = 59$

$$\underline{-43} \quad \underline{-43}$$

$$x = \square$$

c) $37 = x + 19$

$$\underline{-19} \quad \underline{-19}$$

$$\square = x$$

d) $86 = x + 38$

$$\underline{-38} \quad \underline{-38}$$

$$\square = x$$

8. Which number will you subtract from both sides to solve the equation? Subtract the number and solve the equation.

a) $x + 5 = 12$

$$\underline{-5} \quad \underline{-5}$$

$$x = \square$$

b) $x + 14 = 29$

$$\underline{-14} \quad \underline{-14}$$

$$x = \square$$

c) $14 = x + 8$

$$\underline{-8} \quad \underline{-8}$$

$$\square = x$$

d) $53 = x + 24$

$$\underline{-24} \quad \underline{-24}$$

$$\square = x$$

9. Solve the equation by subtracting the same number from both sides.

a) $x + 15 = 33$

$$\underline{-15} \quad \underline{-15}$$

$$x = 18$$

b) $x + 53 = 75$

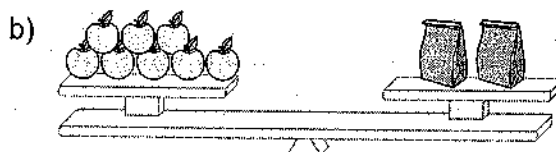
c) $44 = x + 8$

d) $42 + x = 64$

10. The scales are balanced. All bags in the same picture have the same number of apples. How many apples are in each bag?



There are _____ apples in each bag.



There are _____ apples in each bag.

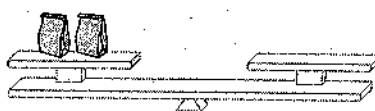
11. Complete the picture and solve the equation. The first one is started for you.

a) $12 = 3 \times b$



$b = \underline{\hspace{2cm}}$

b) $2 \times b = 10$



$b = \underline{\hspace{2cm}}$

c) $4 \times b = 8$



$b = \underline{\hspace{2cm}}$

12. Evaluate.

a) $(5 \times 3) \div 3$

$= \underline{\hspace{2cm}} \div 3$

$= \underline{\hspace{2cm}}$

b) $(3 \times 6) \div 6$

$= \underline{\hspace{2cm}} \div 6$

$= \underline{\hspace{2cm}}$

c) $(8 \times 7) \div 7$

$= \underline{\hspace{2cm}} \div 7$

$= \underline{\hspace{2cm}}$

Multiplying and dividing by the same number gets you back to the number you started with.

Example: $4 \times 3 = 12$, so $12 \div 3 = 4$ or $(4 \times 3) \div 3 = 4$

You can do the same with unknown numbers, letters, and pictures.

Example:  $\times 3 =$   $\div 3 =$ 

$(\text{bag} \times 3) \div 3 = \text{bag}$ or $(b \times 3) \div 3 = b$

13. What number will you divide the expression by to get back to b ?

a) $(b \times 3) \div \underline{\hspace{2cm}} = b$

b) $(b \times 8) \div \underline{\hspace{2cm}} = b$

c) $(b \times 5) \div \underline{\hspace{2cm}} = b$

14. a) Divide both sides by the same number to solve the equation.

i) $b \times 3 = 15$

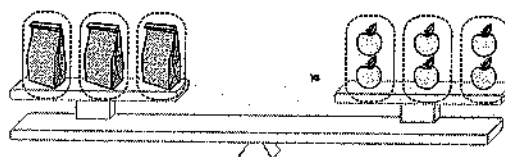
ii) $b \times 5 = 20$

iii) $b \times 2 = 16$

$b \times 3 \div 3 = 15 \div 3$

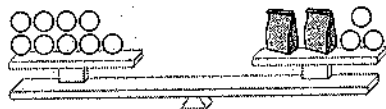
$b = 5$

- b) Use the picture to explain why you can divide both sides by 3 to solve the equation $b \times 3 = 6$.



15. Complete the picture for the equation.

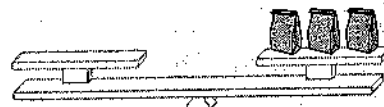
a) $9 = 2 \times b + 3$



b) $2 \times b + 1 = 5$

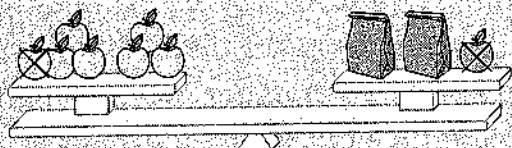


c) $7 = 3 \times b + 1$



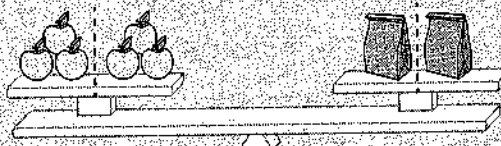
You can solve $7 = 2 \times b + 1$ in two steps using a balance.

Step 1: Cross out 1 apple from each side



$6 = 2 \times b$

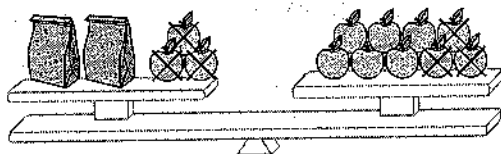
Step 2: Divide each side by 2 to solve the equation



$6 \div 2 = (2 \times b) \div 2$, so $b = 3$

16. Solve the equation in two steps.

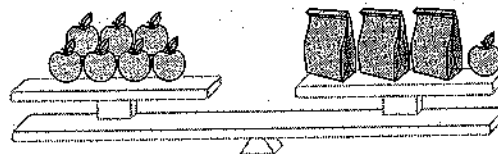
a) $2 \times b + 3 = 9$



$2 \times b = 6$

$b =$

b) $7 = 3 \times b + 1$

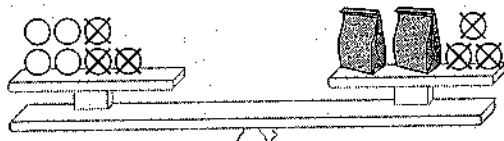


$=$

$=$

17. Complete the picture and solve the equation.

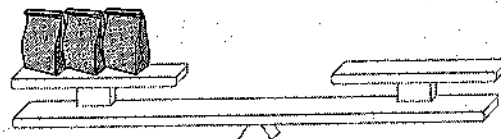
a) $7 = 2 \times b + 3$



$4 = 2 \times b$

$b =$

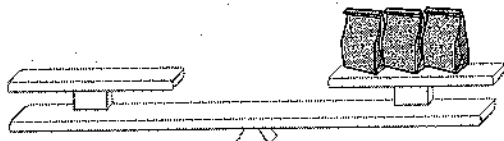
b) $3 \times b + 1 = 10$



$=$

$=$

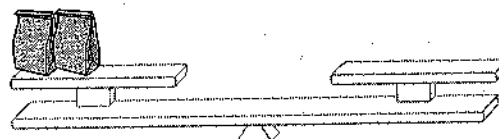
c) $8 = 3 \times b + 2$



$=$

$=$

d) $2b + 5 = 11$



$=$

$=$

PA6-11 Solving Equations—Preserving Equality

1. Write the number that makes the equation true.

a) $8 + 4 - \square = 8$

b) $8 \times 3 \div \square = 8$

c) $8 \div 2 \times \square = 8$

d) $12 \div 4 \times \square = 12$

e) $13 - 6 + \square = 13$

f) $19 + 3 - \square = 19$

2. Write the operation that makes the equation true.

a) $7 + 2 \bigcirc 2 = 7$

b) $8 \times 3 \bigcirc 3 = 8$

c) $12 \div 2 \bigcirc 2 = 12$

d) $15 - 4 \bigcirc 4 = 15$

e) $18 \div 3 \bigcirc 3 = 18$

f) $6 + 4 \bigcirc 4 = 6$

3. Write the operation and number that make the equation true.

a) $17 + 3 \underline{\quad - 3 \quad} = 17$

b) $20 \div 4 \underline{\quad \quad} = 20$

c) $18 \times 2 \underline{\quad \quad} = 18$

d) $11 - 4 \underline{\quad \quad} = 11$

e) $4 \times 3 \underline{\quad \quad} = 4$

f) $15 + 2 \underline{\quad \quad} = 15$

g) $5 \times 2 \underline{\quad \quad} = 5$

h) $5 \div 2 \underline{\quad \quad} = 5$

i) $5 - 2 \underline{\quad \quad} = 5$

j) $n + 3 \underline{\quad - 3 \quad} = n$

k) $n \times 3 \underline{\quad \quad} = n$

l) $5m \underline{\quad \quad} = m$

m) $x - 5 \underline{\quad \quad} = x$

n) $x + 7 \underline{\quad \quad} = x$

o) $z \div 5 \underline{\quad \quad} = z$

REMINDER ► The variable x represents a number, so you can treat it like a number.

Operation	Result	Operation	Result
Add 3 to x .	$x + 3$	Multiply 3 by x .	$3 \times x$ (or $3x$)
Add x to 3.	$3 + x$	Multiply x by 3.	$x \times 3$ (or $3x$)
Subtract 3 from x .	$x - 3$	Divide x by 3.	$x \div 3$
Subtract x from 3.	$3 - x$	Divide 3 by x .	$3 \div x$

4. Show the result of the operation.

a) Multiply x by 7. $\underline{7x}$

b) Add 4 to x . $\underline{x + 4}$

c) Subtract 5 from x . $\underline{\quad \quad}$

d) Subtract x from 5. $\underline{\quad \quad}$

e) Divide x by 10. $\underline{\quad \quad}$

f) Divide 9 by x . $\underline{\quad \quad}$

g) Multiply 8 by x . $\underline{\quad \quad}$

h) Add x to 9. $\underline{\quad \quad}$

BONUS ► Add x to y . $\underline{\quad \quad}$

5. How could you undo the operation and get back to the number you started with?

a) Add 4. subtract 4

b) Multiply by 3. divide by 3

c) Subtract 9. add 9

d) Divide by 2. multiply by 2

e) Add 7. subtract 7

f) Multiply by 5. divide by 5

g) Multiply by 2. divide by 2

h) Divide by 8. multiply by 8

i) Subtract x . add x

6. Solve for x by doing the same thing to both sides of the equation. Check your answer.

a) $3x = 12$

$$3x \div 3 = 12 \div 3$$

$$x = 4$$

Check by replacing

x with your answer: $3(4) = 12 \checkmark$

b) $x \div 6 = 3$

$$x \div 6 \times 6 = 3 \times 6$$

c) $x - 4 = 20$

d) $x \div 3 = 5$

e) $12 + x = 22$

f) $44 = 4x$

g) $x - 17 = 25$

h) $31 = 19 + x$

i) $x + 26 = 53$

j) $11 = x \div 5$

k) $9x = 63$

BONUS $x + 9 = 9 + 45$

Lela solves $7 - x = 5$ in two steps.

Step 1: She treats x as a number and adds x to both sides:

$$7 - x + x = 5 + x$$

$$7 = 5 + x$$

Step 2: She subtracts 5 from both sides to find x :

$$7 - 5 = 5 + x - 5$$

$$2 = x$$

Lela checks her answer. She replaces x in the equation with 2: $7 - 2 = 5 \checkmark$

7. Solve the equation in two steps like Lela. Check your answer.

a) $12 - x = 6$

b) $6 = 13 - x$

c) $24 - x = 20$

$$12 - x + x = 6 + x$$

$$12 = 6 + x$$

$$12 - 6 = 6 + x - 6$$

$$6 = x$$

Check by replacing

x with your answer: $12 - 6 = 6 \checkmark$

d) $3 = 15 - x$

e) $59 - x = 56$

f) $26 = 43 - x$

g) $31 - x = 11$

h) $73 - x = 41$

i) $17 - x = 17$

PA6-12 Solving Equations—Using Logic

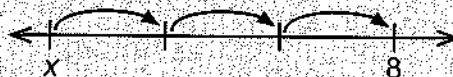
To solve the equation $x + 3 = 8$, Mike and Jill use different methods.

Mike uses preserving equality:

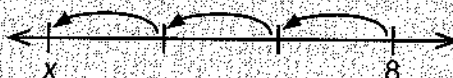
$$\begin{aligned}x + 3 &= 8 \\x + 3 - 3 &= 8 - 3 \\x &= 5\end{aligned}$$

Jill uses logic. She thinks about how addition and subtraction are related:

$x + 3 = 8$ means I have to add 3 to x to get 8.



So, I have to subtract 3 from 8 to find x .



$$x = 8 - 3 = 5$$

Use Jill's method to solve the equation.

a) $x + 5 = 12$

$$x = 12 - 5$$

$$x = 7$$

b) $x + 3 = 10$

c) $x + 25 = 41$

d) $21 + x = 34$

e) $28 = 8 + x$

f) $41 = x + 14$

g) $17 + x = 56$

h) $x + 22 = 33$

i) $16 + x = 34$

j) $x + 35 = 61$

k) $6 + x = 100$

l) $5 + x + 2 = 18$

Mike and Jill solve the equation $x - 2 = 5$.

Mike uses preserving equality:

$$\begin{aligned}x - 2 &= 5 \\x - 2 + 2 &= 5 + 2 \\x &= 7\end{aligned}$$

Jill uses logic:

$x - 2 = 5$ means I have to subtract 2 from x to get 5. So, I have to add 2 to 5 to find x .

$$x = 5 + 2 = 7$$

Use Jill's method to solve the equation.

a) $x - 5 = 12$

$$x = 12 + 5$$

$$x = 17$$

b) $x - 12 = 5$

c) $26 = x - 3$

d) $x - 19 = 9$

e) $x - 7 = 28$

f) $x - 13 = 22$

g) $14 = x - 27$

h) $29 = x - 32$

i) $x - 15 = 62$

j) $43 = x - 19$

k) $x - 51 = 49$

l) $73 = x - 21$

REMINDER ► Division is often written in fractional form.

Examples: $12 \div 4 = \frac{12}{4}$ $15 \div 5 = \frac{15}{5}$ $x \div 3 = \frac{x}{3}$ $w \div 7 = \frac{w}{7}$

3. Solve the division problem.

a) $\frac{6}{3} = \boxed{2}$

b) $\frac{12}{6} = \boxed{}$

c) $\frac{12}{4} = \boxed{}$

d) $\frac{15}{5} = \boxed{}$

Mike and Jill solve the equation $3x = 12$.

Mike uses preserving equality:

$$\begin{aligned} 3x &= 12 \\ 3x \div 3 &= 12 \div 3 \\ x &= 4 \end{aligned}$$

Jill uses logic:

$$\begin{aligned} 3x &= 12 \text{ means I have to multiply } x \text{ by 3 to get 12.} \\ \text{So, I have to divide 12 by 3 to find } x. \\ x &= 12 \div 3 = 4 \end{aligned}$$

4. Use Mike's method to solve the equation by preserving equality.

a) $4x = 12$

b) $2x = 10$

c) $6x = 42$

d) $2x = 14$

$$4x \div 4 = 12 \div 4$$

$$x = 3$$

e) $7x = 28$

f) $6x = 18$

g) $7x = 49$

h) $8x = 48$

Mike and Jill solve the equation $x \div 3 = 8$.

Mike uses preserving equality:

$$\begin{aligned} x \div 3 &= 8 \\ x \div 3 \times 3 &= 8 \times 3 \\ x &= 24 \end{aligned}$$

Jill uses logic:

$$\begin{aligned} x \div 3 &= 8 \text{ means I have to divide } x \text{ by 3 to get 8.} \\ \text{So, I have to multiply 8 by 3 to find } x. \\ x &= 8 \times 3, \text{ so } x = 24 \end{aligned}$$

5. Solve the equation using logic.

a) $x \div 2 = 3$

b) $2x = 8$

c) $x \div 4 = 5$

d) $3 + x = 8$

e) $x - 5 = 6$

$$x = 3 \times 2$$

$$x = 6$$

f) $x \div 3 = 4$

g) $5 + x = 12$

h) $12 = 2x$

i) $15 = 3x$

j) $4 = x \div 3$

k) $x \div 7 = 4$

l) $x \div 4 = 7$

m) $3x = 27$

n) $36 = 12x$

BONUS ► $\frac{x}{3}$

PA6-13 Solving Equations—Guess and Check

Finding the value of a variable that makes an equation true is called solving for the variable. Arsham uses a table to solve $2x + 1 = 7$.

x	$2x + 1$	Is the equation true?
1	3	×
2	5	×
3	7	✓

So $x = 3$ makes the equation true.

1. Complete the table, then solve for x .

a) $3x + 2 = 14$

x	$3x + 2$	True?
1	$3(1) + 2 = 5$	×
2	$3(2) + 2 = 8$	×

so $x =$ _____

b) $4x + 3 = 23$

x	$4x + 3$	True?
1	$4(1) + 3 = 7$	×

so $x =$ _____

c) $5x - 2 = 13$

x	$5x - 2$	True?

so $x =$ _____

2. Replace n with 5 and say whether 5 is too high or too low. Then try a lower or higher number.

a) $3n + 2 = 20$

n	$3n + 2$	Answer
5	$3(5) + 2$	17

5 is too low

b) $5n + 1 = 21$

n	$5n + 1$	Answer
5	$5(5) + 1$	

5 is _____

c) $2n + 3 = 15$

n	$2n + 3$	Answer
5		

5 is _____

d) $4n + 3 = 27$

n	$4n + 3$	Answer
5		

5 is _____

e) $5n - 6 = 14$

n	$5n - 6$	Answer
5	$5(5) - 6$	

5 is _____

f) $3n - 3 = 15$

n	$3n - 3$	Answer
5		

5 is _____

3. Solve for n by guessing small values, checking, and revising.

a) $3n + 2 = 14$

b) $5n - 2 = 13$

c) $4n - 1 = 15$

d) $6n - 5 = 31$

e) $7n - 2 = 19$

f) $2n + 3 = 9$

PA6-14 Word Problems—Addition and Subtraction Equations

1. Fill in the table. Write x for the number you need to find. Cross out the cell you do not use.

	Problem	Parts	How Many?	Difference	Equation and Solution
				Total	
a)	Ethan has 2 dogs and 5 fish. How many pets does he have?	dogs	2	Difference: _____	$2 + 5 = x$ $x = 7$
		fish	5	Total: <u> x </u>	
b)	Sharon hiked 13 km on Saturday. She hiked 14 km on Sunday. How far did Sharon hike in two days?			Difference: _____	
				Total: _____	
c)	Lucy saved \$43 in January. She saved \$14 less in February than in January. How much money did she save in February?			Difference: _____	
				Total: _____	
d)	The Leviathan roller coaster in Canada is 93 m tall. It is 46 m shorter than the Kingda Ka roller coaster in the United States. How tall is Kingda Ka?			Difference: _____	
				Total: _____	
e)	A supermarket sold 473 bags of white and yellow potatoes. If 139 of the bags were filled with white potatoes, how many bags of yellow potatoes were sold?			Difference: _____	
				Total: _____	

2. Write the parts and how many of each part. Then write and solve an equation.

- Clara watched TV for 45 minutes. She spent 15 minutes less on her homework than on watching TV. How much time did she spend on homework?
- A recreation pass costs \$24. It is \$9 more than a movie pass. How much do the two passes cost together?
- The Mercury City Tower in Moscow is 339 m tall. The CN Tower in Toronto is 553 m tall. How much taller is the CN Tower than the Mercury City Tower?



- 3 Solve the problem using an equation for each part. Use your answer from part i) as data for part ii).

- a) Alex read for 30 minutes before dinner and 45 minutes after dinner.
- How many minutes did he spend reading altogether?
 - Alex's dinner took 30 minutes. If he finished his after-dinner reading at 7:50 p.m., when did Alex start eating dinner?
- b) There are 18 players on a soccer team. Seven of them are reserve players and the rest are field players.
- How many field players are on the team?
 - How many more field players than reserve players are on the team?



- 4 Solve the two-step problem by writing equations.

- a) Mary bought 16 red stickers and 25 blue stickers. She used 13 of them. How many stickers does she have left?
- b) There are 28 students in a sixth grade class. Thirteen of them don't wear glasses. How many more students wear glasses than don't wear glasses?
- c) Shawn read 7 mysteries. He read 3 more science fiction books than mysteries. How many books did he read altogether?
- d) Ava had \$75. She spent \$12 on two shirts, \$32 on shoes, and \$25 on a jacket. Does she have enough money to buy a pair of pants for \$14?

- 5 There are 23 500 houses and 12 700 apartments in a town. Use equations to answer the question.

- a) How many houses and apartments are there in total?
- b) How many more houses are there than apartments?
- c) The town plans to tear down 750 houses and replace them with 2400 apartments. How many more houses than apartments will there be?

- BONUS** ► The table shows Sun's savings account balances from June to August. She did not withdraw money from her savings account.

End of June	\$237.57
End of July	\$352.24
End of August	\$528.06

- a) How much did she deposit in July?
- b) How much did she deposit in July and August altogether?
- c) How much more did Sun deposit in August than in July?
- d) Sun wants to buy a computer for \$699.98 by the end of September. Her father told her that he will pay the tax. How much does Sun need to save in September to be able to buy the computer?

PA6-15 Word Problems—Multiplication Equations

Smaller part:

Larger part:

The larger part is 3 times the size of the smaller part.

The scale factor is 3.

You can write an equation to find one part from the other:

Larger part = scale factor $\times$ smaller part

1. Circle the larger thing or quantity. Underline the smaller thing or quantity.

- a) A high rise is seven times as tall as a house. b) There are five times as many apples as pears.
 c) There are four times as many cats as dogs. d) Ed's wallet is one-sixth times as heavy as his suitcase.
 e) A kitten is four times as big as a mouse. f) A bus holds ten times as many people as a car.

2. Write an equation to find the answer. Use x for the unknown amount.

- a) Jen has 6 times as many stamps as Dan. Jen has 24 stamps.
How many stamps does Dan have?

Larger amount: number of Jen's stamps Smaller amount: number of Dan's stamps

Equation: $\frac{24}{\text{Larger part}} = \frac{6}{\text{Scale factor}} \times \frac{x}{\text{Smaller part}}$

- b) A cherry is 10 times as light as an apple. An apple weighs 90 grams.
How much does the cherry weigh?

Larger amount: Smaller amount:

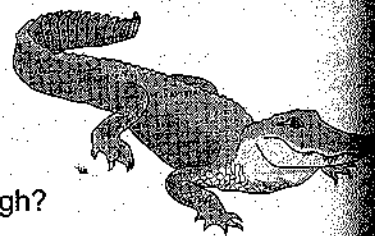
Equation: $\frac{\text{Larger part}}{\text{Larger part}} = \frac{\text{Scale factor}}{\text{Scale factor}} \times \frac{\text{Smaller part}}{\text{Smaller part}}$

- c) A tablet costs \$225. A computer costs three times as much.
How much does the computer cost?

BONUS Lara is one tenth as old as Amir. Lara is 5 years old. How old is Amir?

3. Write and solve an equation for the problem.

- a) Carl planted 8 times as many tomato plants as rose bushes.
He planted 32 rose bushes. How many tomato plants did Carl plant?
 b) A whale shark is five times as long as a great white shark. A whale shark is 20 metres long. How long is the great white shark?
 c) A table is four times as heavy as a chair. The table weighs 220 kg.
How much does the chair weigh?
 d) A male Nile crocodile weighs 620 kg, four times as much as a female American alligator. How much does the female American alligator weigh?



REMINDER ► Total number of things = number of sets $\times$ number in each set

4. Fill in the table. Use x for the unknown.

	Total Number of Things	Number of Sets	Number in Each Set	Equation
a) 40 pictures 8 pictures on each page	40	x	8	$40 = 8x$
b) 30 people 5 vans				
c) 24 flowers 6 pots				
d) 4 chairs at each table 11 tables				
e) 50 houses 10 houses on each block				
f) 9 boxes 22 pencils in each box				

5. Solve each equation in Question 4.

6. Write and solve an equation for the problem.

- A train has 10 cars and 1960 seats. How many seats are in each car?
- A parking lot has 12 equal rows and 492 parking spots. How many cars can park in each row?
- A maple tree is 10 m tall. A pine tree is 3 times as tall as the maple tree. How tall is the pine tree?
- A board game costs 3 times as much as a soft toy. The board game costs \$19.50. How much does the soft toy cost?
- Ben is twice as old as Ella. Ben is 12 years old. How old is Ella?

7. Solve the problem by writing an equation.

- Jane has 7 stickers. Mark has 5 times as many stickers as Jane. How many stickers do they have altogether?
- There are 4 times as many people in City A as in City B. There are 257 301 people in City B. How many people are in City A?
- The planet Uranus is about 2.871 billion kilometres from the sun. Uranus is twice as far from the sun as the planet Saturn. Imagine that the sun, Saturn, and Uranus form a straight line in that order.
 - How far from the sun is Saturn?
 - How far is Uranus from Saturn?

