

2. Solve. Explain your steps.

a) $7 + x = 2x$

b) $3x + 4 = 2x$

c) $6 + 2x = x$

d) $6x - 2 = 7x$

e) $4x = 7 - 3x$

f) $3x = 2x + 8$

3. Solve.

a) $3x + 4 = 2x - 3$

b) $-5 + 9x = 11 + 5x$

c) $2 + 7x = 2x - 3$

d) $x + 12 = 30 - 2x$

e) $5 - 7x = -3x + 9$

f) $-11 + 6x = -6x + 13$

g) $-4x + 12 = 2x + 18$

h) $50 + 7x = 8x + 1$

4. Choose two of the equations you solved in question 3.

Check your solution.

5. Solve each equation.

a) $2x + 12 = x + 20$

b) $-6x + 15 = -x + 5$

c) $-12 + 18x = 3x + 3$

d) $-2x + 3x = 4x + 9$

e) $5 - 6x - 12 = 14 - 7x$

f) $4x - 5x + 7 = 2x - 14$

6. **Assessment Focus** Solve each equation.

Show your work.

a) $3x - 5 = 7 - 3x$

b) $12 + 3x = x - 14$

c) $-6x - 10 = 3x + 8$

d) $-x = x + 6$

e) $9 - 6x = x + 2$

f) $8x - 4 - 3x = 11 + 4x$

7. An auto parts manufacturer buys a machine to produce a specific part.

The machine costs \$15 000.

The cost to produce each part is \$2.

The parts will sell for \$5 each.

Let x represent the number of parts produced and sold.

To break even, the cost, in dollars, $15\,000 + 2x$ must equal the income $5x$.

This can be modelled by the equation: $15\,000 + 2x = 5x$

Solve the equation.

What does the solution represent?

8. **Take It Further** Solve each equation.

a) $4(x - 3) = 3x$

b) $12(5 - x) = 72$

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

In Your Own Words

How many different ways can you solve an equation?

Use an example to illustrate your answer.

7.5 12. Use algebra tiles to explain why:

- a) $3x + 2x$ equals $5x$
 b) $(3x)(2x)$ equals $6x^2$

13. a) Simplify.

- i) $(8x)(3x)$
 ii) $(-2x)(-6x)$
 iii) $(4x^2)(-3x)$
 iv) $(-9x)(-2x^2)$

b) For which products in part a can you use algebra tiles? Explain.

7.6 14. Expand. For which products can you use algebra tiles? Explain.

- a) $x(3x + 4)$
 b) $3x(x^2 - 8)$
 c) $2x(4 - x)$
 d) $6x(-3x^2 + 4x + 2)$

15. Expand.

- a) $-3x(-2x + 3)$
 b) $-2x(x^2 - 5)$
 c) $-5x(3x + 7)$
 d) $2x(4x^2 + 5x - 3)$

16. Write the next 3 lines in the pattern shown on each screen.

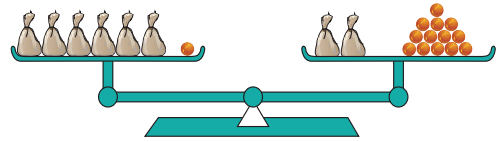
a)

F1+ Tools	F2+ Algebra	F3+ Calc	F4+ Other	F5 Pr3ml	F6+ Clean Up
■	$2 \cdot x \cdot 2 \cdot x^2$				$4 \cdot x^3$
■	$3 \cdot x \cdot 2 \cdot x^2$				$6 \cdot x^3$
■	$4 \cdot x \cdot 2 \cdot x^2$				$8 \cdot x^3$
■	$5 \cdot x \cdot 2 \cdot x^2$				$10 \cdot x^3$
5x * 2x^2					
MAIN	RAD AUTO	FUNC	4/30		

b)

F1+ Tools	F2+ Algebra	F3+ Calc	F4+ Other	F5 Pr3ml	F6+ Clean Up
■	$\text{expand}(x \cdot (x - 3))$				$x^2 - 3 \cdot x$
■	$\text{expand}(2 \cdot x \cdot (x - 3))$				$2 \cdot x^2 - 6 \cdot x$
■	$\text{expand}(3 \cdot x \cdot (x - 3))$				$3 \cdot x^2 - 9 \cdot x$
expand(3x*(x-3))					
MAIN	RAD AUTO	FUNC	3/30		

7.7 17. a) Let x represent the number of candies in each bag. Write the equation represented by the scales.



- b) Solve the equation.
 c) How many candies are in each bag?

18. Solve each equation.

- a) $5x + 8 = x$
 b) $3x + 3 = x + 7$
 c) $2x + 10 = 4$

19. Solve each equation.

- a) $5x - 4 = 8 + 3x$
 b) $6 + 3x = x - 2$
 c) $12 + x = -2x + 9$
 d) $2x - 3 = 6 - x$

20. A fund-raiser is organized for hurricane victims. With the purchase of a \$100 ticket, each person is given a souvenir bracelet (value \$20) and the chance to win a car.

Let x represent the number of tickets sold.

Then, the income, in dollars, from ticket sales is $100x$.

The expenses, in dollars, are $20\,000 + 20x$.

The organizers of the fundraiser would like to raise \$60 000 after all expenses. This can be modelled by the equation:

$$100x = 60\,000 + 20\,000 + 20x$$

- a) Solve the equation.
 b) What does the solution represent?

Practice Test

Multiple Choice: Choose the correct answer for questions 1 and 2.

- Which polynomial is simplified?
 - $3x + 4 - x^2 + 8$
 - $3x^3 - 2x + x^2 - x$
 - $x^2 - 6 + x$
 - $x + 6x - x^2 + 7$
- What is the solution to $80 + 10x = 30x - 20$?
 - $x = 3$
 - $x = 3.5$
 - $x = 5$
 - $x = -5$

Show your work for questions 3 to 6.

- Knowledge and Understanding** Simplify.

- $(3x^2 + 4x - 1) + (2x^2 - 8x - 4)$
- $(x^2 + 3x - 2) - (2x^2 + x - 2)$
- $3(x + 4)$
- $(2x)(3x^2)$
- $4x(x^2 - 5x + 3)$

Which tools could you use to help?

- Application** The cost to rent a hall for the prom is \$400 for the hall and \$30 per person for the meal. This can be modelled by the equation $C = 400 + 30x$, where x is the number of students attending.
 - Suppose 150 students attend. What will be the cost of the prom?
 - The prom committee has \$10 000. What is the greatest number of students that can attend with this budget?
- Communication** How can you tell if a polynomial can be simplified? Include examples in your explanation.
- Thinking** Joe subtracted $(4x^2 - 3x) - (2x^2 - 5x + 4)$. He got the answer $2x^2 - 8x + 4$.
 - What mistake did Joe likely make? Explain.
 - Determine the correct answer.
 - How could you check your answer is correct?

