Warm Up Grade 8

1) Solve   a) 3x -11 = 52   b) $\dfrac{n}{-4} + 5 = -8$

Expand

  2) a) 10(9x - 8)   b) 3(-2g + 7)

  3) Write an equation and SOLVE for the following:

      a) "7 more than a third of a number is 11"

      b) Double a number reduced by 3 is 19

Mental Math
    4) 35% of 80

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Warm Up Grade 8

1) Solve   a) 3x - 11 = 52

$$3x - 11\cancel{+11} = 52 +11$$
$$3x = 63$$
$$\frac{3x}{3} = \frac{63}{3}$$
$$\boxed{x = 21}$$

b) $\dfrac{n}{-4} + 5 = -8$

$$\frac{n}{-4} + 5 -5 = -8 -5$$
$$\frac{n}{-4} = -13$$
$$(-4)\cdot\frac{n}{-4} = -13\cdot(-4)$$
$$\boxed{n = +52}$$

Expand

2) a) $10(9x - 8)$
$$90x - 80$$

b) $3(-2g + 7)$
$$-6g + 21$$

3) Write an equation and SOLVE for the following:

a) "7 more than a third of a number is 11"

b) Double a number reduced by 3 is 19

a) $\dfrac{x}{3} + 7 = 11$

$$\frac{x}{3} + 7 - 7 = 11 - 7$$
$$\frac{x}{3} = 4$$
$$3\cdot\frac{x}{3} = 4\cdot 3$$
$$\boxed{x = 12}$$

b) $2x - 3 = 19$

$$2x - 3 + 3 = 19 + 3$$
$$2x = 22$$
$$\frac{2x}{2} = \frac{22}{2}$$
$$\boxed{x = 11}$$

Mental Math
4) 35% of 80

$$10\% \text{ of } 80 = 8$$
$$\times 3 \qquad\qquad \times 3$$
$$\overline{30\% \text{ of } 80 = 24}$$

$$\div 2 \Big(\begin{array}{l} 10\% \text{ of } 80 = 8 \\ 5\% \text{ of } 80 = 4 \end{array} \Big) \div 2$$

$$35\% \text{ of } 8 = 28$$

SAMDEB

1) Solve 　a) 3x - 11 = 52

$3x - 11 + 11 = 52 + 11$

$3x = 63$

$$\frac{3x}{3} = \frac{63}{3}$$

$\boxed{x = 21}$

b) $\dfrac{n}{-4} + 5 = -8$

$\dfrac{n}{-4} + 5 - 5 = -8 - 5$

$\dfrac{n}{-4} = -13$

$(-4) \cdot \dfrac{n}{-4} = -13 \cdot (-4)$

$\boxed{n = 52}$

Expand 　10 groups of 9x - 8

2) a) 10(9x - 8)

$= 90x - 80$

b) 3(-2g + 7)

$-6g + 21$

3) Write an equation and SOLVE for the following:

a) "7 more than a third of a number is 11"

b) Double a number reduced by 3 is 19

a) Let x = a number

$\dfrac{x}{3} + 7 = 11$

$\dfrac{x}{3} + 7 - 7 = 11 - 7$

$\dfrac{x}{3} = 4$

$3 \cdot \dfrac{x}{3} = 4 \cdot 3$

$\boxed{x = 12}$

b) $2x - 3 = 19$

$2x - 3 + 3 = 19 + 3$

$2x = 22$

$\dfrac{2x}{2} = \dfrac{22}{2}$

$\boxed{x = 11}$

Mental Math

4) 35% of 80

10% of 80 = 8

$\times 3$ 　　　　 $\times 3$

30% of 80 = ⃝24

10% of 80 = 8

$\div 2$ 　　　　 $\div 2$

5% of 80 = ④

35% of 80 = 28

4a) $7(3+8)$ $7 \times 3 + 7 \times 8$

    $7(11)$ $21 + 56$

      77 77

b) $5(7-2)$ $5 \times 7 - 5 \times 2$

    5×5 $35 - 10$

     25 25

c) $-2(9-4)$ $[9+(-4)]$ $-2 \times 9 + -2 \times -4$

  $-2(5)$ $-18 + (+8)$

   -10 -10

The answers are the same
for each pair.

5. $5(x+2)$
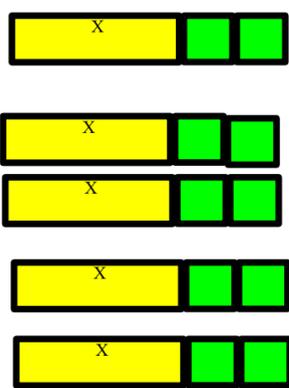
$5x + 10$
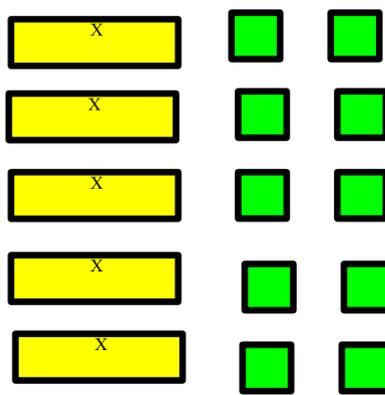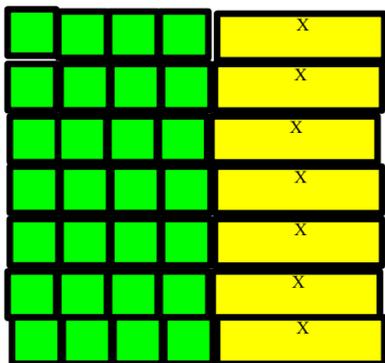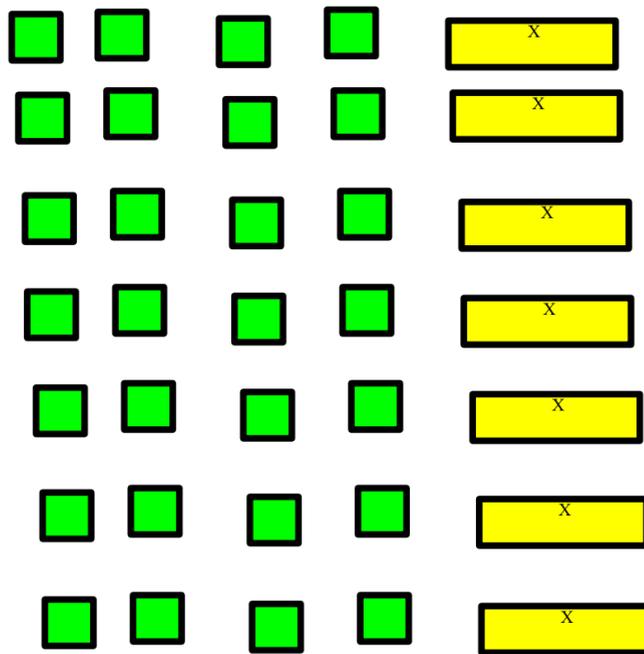
5 groups of $x+2$

5 x's and ten 1's

6. $7(4+s)$

$28 + 7s$

7 groups of
$4 + s$

28 ones and 7 s's

7a) $2(x+10)$
$2x+20$

b) $5(a+1)$

c) $10(f+2)$
$10f+20$

d) $6(12+g)$

e) $8(8+y)$
$64+8y$

f) $5(s+6$

g) $3(9+p)$
$27+3p$

h) $4(11+r)$

i) $7(g+15)$
$7g+105$

j) $9(7+h)$

-3(2x-7)

$-6x + 21$

-2(-5t + 8)

$10t - 16$

The Distributive property may also appear in solving equations.
When it does, **first you have to apply the distributive property, then solve as you normally would.**

outside Bracket, you multiply
each term on inside bracket. Then
solve as usual

Solve the following:

(a) $2(x + 4) = 18$

$2x + 8 = 18$

$2x + 8 - 8 = 18 - 8$

$2x = 10$

$\dfrac{2x}{2} = \dfrac{10}{2}$

$\boxed{x = 5}$

(b) $3(x - 5) = 9$

$3x - 15 = 9$

$3x - 15 + 15 = 9 + 15$

$3x = 24$

$\dfrac{3x}{3} = \dfrac{24}{3}$

$\boxed{x = 8}$

Word Problem

Ex)

5 people

I have 4 friends. We each have a package of cookies and we each have 2 cookies that are not in the package. If we have 50 cookies in total, how many cookies are in each package?

Let $x \equiv$ # of cookies in each package.

hint : How many people?

$$5(c + 2) = 50$$

$$5c + 10 = 50$$

$$5c + 10 - 10 = 50 - 10$$

$$5c = 40$$

$$\frac{5c}{5} = \frac{40}{5}$$

$$\boxed{c = 8}$$

Each packa

multiply

Bill's mom pays Bill $0.25 for each sock he folds. But she gave him $20 for being a great son. If she gave him a total $25.50, then how many socks did he fold? (Show work)

Let $x \equiv$ # of sock Bill folded.

$$0.25x + 20 = \$25.50$$

$$0.25x + 20 - 20 = 25.50 - 20$$

$$0.25x = 5.50$$

$$\frac{0.25x}{0.25} = \frac{5.50}{0.25}$$

$$\boxed{x = 22}$$

Bill folded 22 socks.

Class/Homework

pg. 342 #7abcde, #8abcde, #11 #12ace, 13, 14, 15 :

*Homework pg. 347 # 4-5 all
~~on test~~

Test PART 1 outline

5 MC

6 Short Response

#1 Draw tiles and solve an equation

#2 Use Algebra tiles or box method to prove distributive property

#3 For each problem, state **the variable, write and solve the equation, verify and give a statement.** (Like warm up on Friday)

#4 Solve   Ex)   2(x-3)= 16

#5 For each of the following tell whether the pair of expressions is equivalent or not.

#6 (Is it correct if yes then verify if no then redo)

Pg 342

12. Expand.
   a) $-6(c + 4)$ b) $-8(a - 5)$
   c) $10(f - 7)$ d) $3(-8 - g)$
   e) $-8(8 - y)$ f) $-2(-s + 5)$
   g) $-5(-t - 8)$ h) $-9(9 - w)$

13. Assessment Focus Which pairs of expressions are equivalent? Explain your reasoning.
   a) $2x + 20$ and $2(x + 20)$
   b) $3x + 7$ and $10x$
   c) $6 + 2t$ and $2(t + 3)$
   d) $9 + x$ and $x + 9$

14. There are 15 players on the Grade 8 baseball team. Each player needs a baseball cap and a team jersey. A team jersey costs \$25. A baseball cap costs \$14.
   a) Write 2 different expressions to find the cost of supplying the team with caps and jerseys.
   b) Evaluate each expression. Which expression did you find easier to evaluate? Explain.

15. Five friends go to the movies. They each pay \$9 to get in, and \$8 for a popcorn and drink combo.
   a) Write 2 different expressions to find the total cost of the outing.
   b) Evaluate each expression. Which expression was easier to evaluate? Justify your choice.

16. Match each expression in Column 1 with an equivalent expression in Column 2.

Column 1	Column 2
a) $6(t - 6)$	i) $6t + 36$
b) $-6(t - 6)$	ii) $-6t + 36$
c) $-6(t + 6)$	iii) $-6t - 36$
d) $6(6 + t)$	iv) $6t - 36$

17. Take It Further
   Harvey won some money on a scratch-and-win ticket. Then, he won a \$2 bonus. When he arrived at the counter, he noticed that he had also won a "triple your winnings" ticket. As Harvey was cashing in his prize, the cashier told him he was the 100th customer, so his total winnings were automatically doubled. Write two algebraic expressions to describe Harvey's winnings.

18. Take It Further
   a) Expand.
      i) $7(5 + y - 2)$
      ii) $-3(-t + 8 - 3)$
      iii) $-8(-9 + s + 5)$
      iv) $12(-10 - p + 7)$

4. Solve each equation using the distributive property. Verify the solution.
a) $3(x + 5) = 36$
b) $4(p - 6) = 36$
c) $5(y + 2) = 25$
d) $10(a + 8) = 30$

5. Solve each equation. Verify the solution.
a) $-2(a + 4) = 18$
b) $-3(r - 5) = -27$
c) $7(-y + 2) = 28$
d) $-6(c - 9) = -42$

6. Marc has some hockey cards. His friend gives him 3 more cards. Marc says that if he now doubles the number of cards he has, he will have 20 cards. How many cards did Marc start with?
a) Choose a variable to represent the number of cards Marc started with. Write an equation to model this problem.
b) Solve the equation using the distributive property.
c) Verify the solution. Explain your thinking in words.

7. A student wrote this equation to solve the problem in question 6:
$2n + 3 = 20$
How would you explain to the student why this is incorrect?

Apply

8. The perimeter of a rectangle is 26 cm. The rectangle has length 8 cm. What is the width of the rectangle?
a) Write an equation that can be solved using the distributive property.
b) Solve the equation.
c) Verify the solution.

9. **Assessment Focus** The price of a souvenir T-shirt was reduced by $5. Jason bought 6 T-shirts for his friends. The total cost of the T-shirts, before taxes, was $90. What was the price of a T-shirt before it was reduced?
a) Write an equation to model this problem.
b) Solve the equation.
c) Verify the solution. Explain how you know it is correct.

10. Chuck and 7 friends went to Red Deer's Westerner Days fair. The cost of admission was $6 per person. They each bought an unlimited midway ride ticket. The total cost of admission and rides for Chuck and his friends was $264. What was the price of an unlimited midway ride ticket?
a) Write an equation to model this problem.
b) Solve the equation. Verify the solution.

7a) $2(x+10)$
$2x+20$

b) $5(a+1)$
$5a+5$

c) $10(f+2)$
$10f+20$

d) $6(12+g)$
$72+7g$

e) $8(8+y)$
$64+8y$

f) $5(s+6$
$5s+30$

g) $3(9+p)$
$27+3p$

h) $4(11+r)$
$44+4r$

i) $7(g+15)$
$7g+105$

j) $9(7+h)$
$63+9h$

8 a) $3(x-7)$
$3x - 21$

b) $4(a-3)$
$4a - 12$

c) $9(h-5)$
$9h - 45$

d) $7(8-f)$
$56 - 7f$

e) $5(1-s)$
$5 - 5s$

f) $6(p-2)$
$6p - 12$

g) $8(11-t)$
$88 - 8t$

h) $2(15-v)$
$30 - 2v$

i) $10(b-8)$
$10b - 80$

j) $11(c-4)$
$11c - 44$

9. $Per = s+s+s+s$
$= b + h + b + h$
or $2b + 2h$

or

$Per = 2(b+h)$
$= 2b + 2h$

(Discuss)

10. $hb = bh$

When you multiply order does not matter

$2 \times 3 = 3 \times 2$

therefore

$h \times b = b \times h$

11. $9(6-t)$
$= 54 - 9t$
which is (a)

12. a) $-6(c+4)$
$-6c - 24$

b) $-8(a-5)$ $(-8)(-5)$

c) $10(f-7)$
$10f - 70$

d) $3(-8-g)$

e) $-8(8-y)$ $-64-(-8y)$
$-64+8y$ $-64+8y$

f) $-2(-s+5)$

g) $-5(-t-8)$
$5t + 40$ $5t - (-40)$

h) $-9(9-w)$ $-81 - (-9w)$

13. a) $2x+20$ and $2(x+20)$

not equivalent

$2(x+20)$

$=2x+40$

They didn't multiply the 20 by 2.

b) $3x+7$ and $10x$

not equivalent

could model to show

$3x+7x$ equals $10x$, but you don't add the 3 and the 7 in $3x+7$ because they are unlike terms.

c) $6+2t$ and $2(t+3)$

equivalent

$2(t+3)$

$2t+6$ which is the same as $6+2t$ (add in any order).

d) $9+x$ and $x+9$

equivalent

you can add in any order.

14. $15 \times 25 + 15 \times 14$ OR $15(25+14)$

b) $375 + 210$
$\quad 585$

$\qquad\qquad\qquad 15(39)$
$\qquad\qquad\qquad\quad 585$

15. a) (b)
$5 \times 9 + 5 \times 8$ OR $5(9+8)$
$\quad 45 + 40$ $5(17)$
$\qquad 85$ 85

16. Column 1   Column 2

a) $6(t-6)$
$\quad 6t - 36$ (iv)

b) $-6(t-6)$
$\quad -6t + 36$ (ii)

c) $-6(t+6)$
$\quad -6t - 36$ (iii)

d) $6(6+t)$
$\quad 36 + 6t$ (i)

18. a) $7(\underline{5} + y \underline{-2})$

$7(3 + y)$

$21 + 7y$

or $7(5 + y - 2)$

$35 + 7y - 14$

$21 + 7y$

b) $-3(-t + 8 - 3)$

$-3(-t + 5)$

$3t - 15$

c) $-8(\underline{-9} + s \underline{+5})$

$-8(-4 + s)$

$32 + (-8s)$

$32 - 8s$

d) $12(\underline{-10} - p \underline{+7})$

$12(-3 - p)$

$-36 - 12p$

19 a) $2(7 + b + c)$
$14 + 2b + 2c$

b) $11(-6 + e - f)$
$-66 + 11e - 11f$

c) $-1(-r + s - 8)$
$r - s + 8$

d) $-10(-6 - v - w)$
$60 + 10v + 10w$

e) $5(j - 15 - k)$
$5j - 75 - 5k$

f) $-4(-g + 12 - h)$
$4g - 48 + 4h$