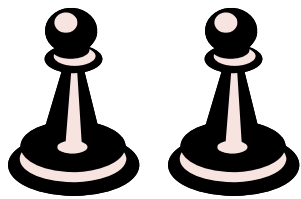


Name _____

Hands on Equations Lessons 1-12



10

$$2x = 10$$

$$x = 5$$

Hands on Equations

Objective:

Get all of the pawns on one side
and all of the cubes on the other.
Get the variable by itself.

Golden Rule

Whatever you do to one side, you
must do to the other.

How to Check:

Go back to the original problem.

HANDS-ON EQUATIONS[®]

Lesson #1
Classwork Sheet

Name: _____
Grade: _____

Find the value of the pawn in each of the following problems and write the check:

1. $\triangle \triangle \mid \boxed{10}$ $X =$ Check: _____

2. $\triangle \boxed{2} \mid \boxed{9}$ $X =$ Check: _____

3. $\triangle \triangle \boxed{3} \mid \boxed{7}$ $X =$ Check: _____

4. $\triangle \boxed{8} \mid \triangle \triangle \triangle$ $X =$ Check: _____

5. $\triangle \triangle \boxed{2} \mid \boxed{4}$ $X =$ Check: _____

6. $\triangle \boxed{8} \mid \boxed{10} \boxed{4}$ $X =$ Check: _____

7. $\triangle \triangle \mid \boxed{4} \triangle$ $X =$ Check: _____

8. $\triangle \triangle \triangle \boxed{2} \mid \boxed{7} \boxed{7}$ $X =$ Check: _____

9. $\triangle \triangle \boxed{4} \mid \triangle \boxed{10}$ $X =$ Check: _____

10. $\triangle \triangle \triangle \mid \triangle \boxed{10} \boxed{2}$ $X =$ Check: _____

HANDS-ON EQUATIONS[®]

Lesson #2
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $2x = x + 3$ $x =$ Check: _____

2. $3x = x + 4$ $x =$ Check: _____

3. $x + 4 = 2x + 3$ $x =$ Check: _____

4. $4x = 2x + 6$ $x =$ Check: _____

Previous Work

5. $\triangle \triangle \triangle \mid \boxed{10} \boxed{2}$ $x =$ Check: _____

6. $\triangle \triangle \boxed{1} \mid \boxed{10} \boxed{5}$ $x =$ Check: _____

7. $\triangle \boxed{8} \mid \boxed{10} \boxed{6}$ $x =$ Check: _____

8. $\triangle \triangle \boxed{5} \mid \triangle \triangle \triangle \boxed{1}$ $x =$ Check: _____

9. $\triangle \triangle \boxed{1} \mid \triangle \boxed{3}$ $x =$ Check: _____

10. $\triangle \triangle \boxed{5} \mid \boxed{10} \boxed{10} \boxed{5}$ $x =$ Check: _____

Hands on Equations

Simply the Expression

Addition

Ex # 1) $4X + 2 + 2X$

 $6X + 2$

Ex # 2) $4X + 3 + X + 2$

 $5X + 5$

Ex # 3) $3X + 2X + X + 5$

 $6X + 5$

- Simplify the expression
- Create a new original problem
- Combine variables (x's) with variables (x's)
- Combine numbers with numbers
- Not always possible to simply on both sides
- Do not combine across the equal sign

Practice

1) $2X + 3 + 2X$

2) $4X + X + 6 + 2X$

3) $6X + 5 + 6X + 5$

4) $4X + 3 + 9X + 11$

5) $14X + 19 + 13X + 3$

6) $51X + 14 + 9X + 6$

Do not forget to
combine the variables
with variables and
numbers with numbers
to create a new original
problem.

HANDS-ON EQUATIONS[®]

Lesson #3
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $3x+7=4x$ $x=$ Check: _____

2. $x+2+2x=x+10$ $x=$ Check: _____

3. $x+3x=x+x+10$ $x=$ Check: _____

4. $2x+3+3x=x+11$ $x=$ Check: _____

Previous Work

5. $\begin{array}{c} \blacktriangle \quad \blacktriangle \\ \hline \end{array} + \begin{array}{|c|c|} \hline 10 & 2 \\ \hline \end{array} = x$ Check: _____

6. $\begin{array}{c} \blacktriangle \quad \blacktriangle \quad \blacktriangle \quad \blacktriangle \\ \hline \end{array} + \begin{array}{|c|c|} \hline 10 & 10 \\ \hline \end{array} = x$ Check: _____

7. $\begin{array}{c} \blacktriangle \quad \boxed{1} \quad \blacktriangle \quad \blacktriangle \\ \hline \end{array} + \begin{array}{c} \blacktriangle \quad \boxed{5} \\ \hline \end{array} = x$ Check: _____

8. $2x+2=x+5$ $x=$ Check: _____

9. $3x+1=x+13$ $x=$ Check: _____

10. $x+3+2x=x+5$ $x=$ Check: _____

**Do not forget to
combine the variables
with variables and
numbers with numbers
to create a new original
problem.**

HANDS-ON EQUATIONS[®]

Lesson #4
Classwork Sheet



Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $x+2x+5=x+19$ $x=$ Check: _____
2. $x+2x+14=5x+2$ $x=$ Check: _____
3. $x+4+2x=x+20$ $x=$ Check: _____
4. $x+2+2x=x+12$ $x=$ Check: _____

Previous Work

5.  $x=$ Check: _____
6.  $x=$ Check: _____
7. $5x=3x+10$ $x=$ Check: _____
8. $3x+x=2x+2$ $x=$ Check: _____
9. $2x+4+2x=x+10$ $x=$ Check: _____
10. $x+2+2x+3=4x$ $x=$ Check: _____

Hands on Equations

Simply the Expression

Subtraction

Ex # 1) $4X - 2X + 3$

$2X + 3$

Ex # 2) $4X + 3 - 2X + 5$

$2X + 8$

Ex # 3) $2X + 3 - X$

$X + 3$

- Simplify the expression
- Create a new original problem
- Subtract variables (x's) with variables (x's)
- Combine numbers with numbers
- Not always possible to simply on both sides
- Do not combine across the equal sign

Practice

1) $X + 2X - X + 16$

2) $5 + 3X + 6 - X$

3) $4X - 2X - X + 3$

4) $16X + 3 - 8X + 5$

Do not forget to
combine the variables
with variables and
numbers with numbers
to create a new original
problem.

HANDS-ON EQUATIONS[®]

Lesson #5
Classwork Sheet

Name: _____
Grade: _____

Use Your Hands-On Equations Kit to solve:

New Work

1. $4x - 2x + 4 = x + 10$ $x =$ Check: _____

2. $x + 3x - x = 30$ $x =$ Check: _____

3. $8 + 2x + 3 - x = 2x + 1$ $x =$ Check: _____

4. $x + 2x - x + 7 = 4x - x + 2$ $x =$ Check: _____

Previous Work

5. $\triangle \triangle \boxed{3} \mid \boxed{10} \boxed{5}$ $x =$ Check: _____

6. $\triangle \boxed{4} \triangle \mid \triangle \boxed{8}$ $x =$ Check: _____

7. $4x = 2x + 4$ $x =$ Check: _____

8. $x + 3 + 2x = x + 3$ $x =$ Check: _____

9. $2x + x + 4 + 2x = x + 20$ $x =$ Check: _____

10. $2x + 8 + x = 2x + 15$ $x =$ Check: _____

1) Multiply the number outside the parentheses times each number inside of the parentheses.

2) Bring down the operation sign (+ or -)

Reminder:

$$2(X + 5) = 2X + 10 \text{ (NOT } 2X + 7)$$

HANDS-ON EQUATIONS[®]

Lesson #6
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $2(x+3) = 10$ $x =$ Check: _____

2. $2(x+3) = 9+x$ $x =$ Check: _____

3. $2(2x+1) = 3x+8$ $x =$ Check: _____

4. $2(2x+3) = x+9$ $x =$ Check: _____

Previous Work

5. $\frac{\blacktriangle\blacktriangle \square}{\square\square} = \frac{\square\square \square}{\square}$ $x =$ Check: _____

6. $\frac{\square\square \square}{\square\square} = \frac{\blacktriangle\blacktriangle \square}{\square}$ $x =$ Check: _____

7. $x+4 = 2x+3$ $x =$ Check: _____

8. $x+x+x+2x+1 = 11$ $x =$ Check: _____

9. $3x+5 = x+19$ $x =$ Check: _____

10. $4x-2x+3 = 2x+2x-x$ $x =$ Check: _____

HANDS-ON EQUATIONS®

Lesson #7
Classwork Sheet

Name: _____
Grade: _____

New Work

Use the pictorial system to solve these problems:

1. $3x + 2x = 10$ $x =$ Check: _____

2. $4x + 2x = x + x + 20$ $x =$ Check: _____

3. $3x + 5 = x + 19$ $x =$ Check: _____

4. $2(3x + 1) = x + 22$ $x =$ Check: _____

Previous Work

Use your Hands-On Equations Kit to solve:

5. $\frac{\boxed{10} \boxed{10} \boxed{4}}{\quad}, \triangle \triangle \triangle \triangle$ $x =$ Check: _____



6. $\triangle \triangle \triangle \boxed{4}, \triangle \triangle \boxed{7}$ $x =$ Check: _____

7. $5x + 2 = 3x + 12$ $x =$ Check: _____

8. $2x + 1 + x + 4 = x + 16 + x$ $x =$ Check: _____

9. $5x - 3x + x + 8 = 2x + 1 + x + x$ $x =$ Check: _____

10. $2(x + 4) = x + 10$ $x =$ Check: _____

	=	X
	=	*
Solve the same way!		

HANDS-ON EQUATIONS[®]

Lesson #8
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $\triangle \triangle \triangle \boxed{2} \mid \triangle \triangle \boxed{8}$ $\times =$ Check: _____

2. $3x - x = x + 9$ $\times =$ Check: _____

3. $5 + 2x + x = 3x - x + 8$ $\times =$ Check: _____

4. $2(5 + 2x) = 18 + 3x$ $\times =$ Check: _____

Previous Work

5. $\triangle \triangle \triangle \mid \boxed{10} \boxed{10} \boxed{1}$ $x =$ Check: _____

6. $\triangle \triangle \triangle \mid \boxed{10} \boxed{4} \triangle$ $x =$ Check: _____

7. $4x + 3 = x + 21$ $x =$ Check: _____

8. $5 + x + 3x - x = 2x + 9 - x$ $x =$ Check: _____

9. $2(3x + 1) = 8$ $x =$ Check: _____

10. $2(2x + 2) = x + 10$ $x =$ Check: _____

Evaluate by substituting the value given in the problem and get the answer.

Remember that X and * are opposites of each other. Ex) if X = 5, then * = -5

Be sure to simplify first (get a new original problem.)

HANDS-ON EQUATIONS[®]

Lesson #9
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. If $x=2$, evaluate: $\blacktriangle\blacktriangle\triangle$ $\boxed{5}$ _____ Ans. _____

2. If $* = 3$, evaluate: $*+2x+2*+7$ _____ Ans. _____

3. If $* = -2$, evaluate: $3x+*+10+3*$ _____ Ans. _____

4. If $x=-5$, evaluate: $2x+4*-*+1$ _____ Ans. _____

Previous Work

5. $\blacktriangle\blacktriangle\boxed{4}$, $\blacktriangle\blacktriangle\blacktriangle\boxed{3}$ $x=$ Check: _____

6. $3x+4=2x+10$ $x=$ Check: _____

7. $x+x+x+1=x+17$ $x=$ Check: _____

8. $3x+x-2x+7=x+15$ $x=$ Check: _____

9. $2x+x+x+9=x+2x+12$ $x=$ Check: _____

10. $3(x+1)=10+2x$ $x=$ Check: _____

HANDS-ON EQUATIONS[®]

Lesson #10
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $\frac{\blacktriangle\blacktriangle\triangle\boxed{2}}{\quad} = \frac{\boxed{4}}{\quad}$ $x =$ $x =$ Check: _____

2. $3x = x + x + 9$ $x =$ $x =$ Check: _____

3. $3x + x = x + 6$ $x =$ $x =$ Check: _____

4. $x + x + 4x = 16 + 2x$ $x =$ $x =$ Check: _____

Previous Work

5. $\frac{\blacktriangle\blacktriangle\blacktriangle\blacktriangle\blacktriangle\blacktriangle\blacktriangle\blacktriangle\boxed{10}\boxed{10}\boxed{7}}{\quad}$ $x =$ Check: _____

6. $5 + 3x + x = x + x + x + 9$ $x =$ Check: _____

7. $7x - 4x + 2x + 5 = 2x + 14$ $x =$ Check: _____

8. $3(2x + 1) = 13 + x$ $x =$ Check: _____

9. If $x = 4$, evaluate: $3x + 4x + 5$ Ans. _____

10. $2x + 3x + 1 = x + 11 + 3x - x$ $x =$ $x =$ Check: _____

HANDS-ON EQUATIONS[®]

Lesson #11
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $\frac{\triangle \triangle}{\quad} + \frac{\blacktriangle \boxed{9}}{\quad}$ $x =$ $x =$ Check: _____

2. $2x + 4 = 2x$ $x =$ $x =$ Check: _____

3. $x = x + 4$ $x =$ $x =$ Check: _____

4. $3x = 10 + 2x$ $x =$ $x =$ Check: _____

Previous Work

5. $\frac{\blacktriangle \blacktriangle \blacktriangle \boxed{1}}{\quad} + \frac{\blacktriangle \blacktriangle \boxed{2}}{\quad}$ $x =$ Check: _____

6. $4x + 2x + 1 = 2x - x + 21$ $x =$ Check: _____

7. $2(2x) + 10 = 3x + 13$ $x =$ Check: _____

8. If $x = -3$, evaluate: $2x + x + 2x + 5$ Ans. _____

9. $2(2x + 1) + x = x + 2x + 18$ $x =$ Check: _____

10. $2x + x + 2x = 10 + x$ $x =$ $x =$ Check: _____

HANDS-ON EQUATIONS[®]

Lesson #12
Classwork Sheet

Name: _____
Grade: _____

Use your Hands-On Equations Kit to solve:

New Work

1. $\triangle \triangle \triangle \mid \blacktriangle \boxed{10} \boxed{6}$ $x =$ $\times =$ Check: _____

2. $3x + 15 = 2x$ $x =$ $\times =$ Check: _____

3. $x = x + 24$ $x =$ $\times =$ Check: _____

4. $x + 2x + 8 = x$ $x =$ $\times =$ Check: _____

Previous Work

5. $3x + x - 2x + 8 = 3x + x$ $x =$ Check: _____

6. $2(2x + 4) - 2x = x + 18$ $x =$ Check: _____

7. If $x = 5$, evaluate: $2(x + 3) + 3x$ Ans. _____

8. $3(2x) - 3x + 4 = 2x + 5$ $\times =$ Check: _____

9. $3x + 2x + x = x + 6$ $x =$ $\times =$ Check: _____

10. $2(x + 4) + x = 16$ $x =$ $\times =$ Check: _____