10.1   Reading Mathematical Expressions - Worksheet 1

1   Consider the expression $(x+2)(x-5)$. Describe the "big picture" perspective of the expression and put boxes around the terms as appropriate.

2   Consider the expression $x+2(x-5)$. Describe the "big picture" perspective of the expression and put boxes around the terms as appropriate.

Many students treat this calculation like the previous one. It's an easy "gotcha" problem to catch students that aren't paying attention.

3   Determine whether you think the following equation is valid. Explain your reasoning.

$$\sin(x + y) = \sin(x) + \sin(y)$$

Hint: This is one of the special named functions that was discussed in this chapter.

4   Solve the equation $x\ln(2) + 3 = -4$. Do it once using a substitution for $\ln(2)$, then do it without a that substitution. Use a complete presentation both times.

10.2 Reading Mathematical Expressions - Worksheet 2

1 Consider the expression $2x(x-3)+4$. Describe the "big picture" perspective of the expression and put boxes around the terms as appropriate.

2 Evaluate the expression $2x(x-3)-5$ when $x=2$. Use a complete presentation.

There are no examples of this! Use your best judgment of what a "complete presentation" would like for this calculation based on your experience. Start trusting yourself.

3 Check the presentation for errors. If you find one, circle it and describe the mistake in words.

$$3x + f(4) = f(10)$$
$$3x + 4 = 10 \qquad \text{Cancel out the } f$$
$$3x = 6 \qquad \text{Subtract } 4 \text{ from both sides}$$
$$x = 2 \qquad \text{Divide both sides by } 3$$

4 Check the presentation for errors. If you find one, circle it and describe the mistake in words.

$$\exp(x) + 3 = 8$$
$$\exp(x) = 5 \qquad \text{Subtract 3 from both sides}$$
$$x = \frac{5}{\exp} \qquad \text{Divide both sides by } \exp$$

10.3 Reading Mathematical Expressions - Worksheet 3

1 Consider the expression $(x + 1)^2 - (x - 1)^2$. Describe the "big picture" perspective of the expression and put boxes around the terms as appropriate.

2 Check the presentation for errors. If you find one, circle it and describe the mistake in words.

$$(x + 4)^2 - (x - 3)^2 = (x^2 + 16) - (x^2 - 9) \qquad \text{Distribute the square}$$
$$= x^2 - x^2 + 16 + 9 \qquad \text{Rearrange the terms}$$
$$= 25 \qquad \text{Combine like terms}$$

3 Simplify the expression $(x + 1)^2 - (x - 1)^2$ using a complete presentation.

4 Solve the equation $2\tan(x) - 5 = -3$ for $\tan(x)$. Do it once using a substitution for $\tan(x)$, then do it without that substitution. Use a complete presentation both times.

10.4   Reading Mathematical Expressions - Worksheet 4

1   Check the presentation for errors. If you find one, circle it and describe the mistake in words.

$$6 \exp(2) = 10$$
$$x = \frac{10}{\exp(2)} \qquad \text{Divide both sides by } \exp(2)$$
$$x = \frac{5}{\exp(1)} \qquad \text{Reduce}$$

2   Solve the equation $ax + b = c$ for the variable x using a complete presentation.

3   Check the presentation for errors. If you find one, circle it and describe the mistake in words.

$$x \log(5) = \log(7)$$
$$x = \frac{\log(7)}{\log(5)} \qquad \text{Divide both sides by } \log(5)$$
$$x = \frac{7}{5} \qquad \text{Cancel out the log}$$

4   Solve the equation $2 \log(x) = \log(x) + 5$ for $\log(x)$. Do it once using a substitution for $\log(x)$, then do it without that substitution. Use a complete presentation both times.

Students can start to feel lost with a problem like this. But the substitution helps them to visually identify where the variable terms are located, and it helps them to see how to proceed.

10.5   Reading Mathematical Expressions - Worksheet 5

1

Solve the equation $ax + b = cx + d$ for the variable x using a complete presentation.

2

Solve the equation $x \sin(1) + \cos(2) = x \ln(3) - f(4)$. Use a complete presentation.

Try to do this without making substitutions.

3

Solve the equation $3 \ln(x) + \ln(4) = 8$ for $\ln(x)$. Use a complete presentation.

4

Solve the equation $3x + \log(6) = \exp(3)$. Use a complete presentation.