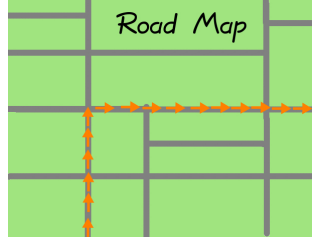## Module 0.5:   Diagnostic Zero: Fundamentals of Algebra

Road Map

This diagnostic is only intended for those students who had some trouble, no matter how little or how much, with Questions # 1 and # 2 of Diagnostic Two, or perhaps a student who was directed here by their instructor. No other students need worry about this diagnostic. This diagnostic contains only 15 questions, and you have unlimited time.
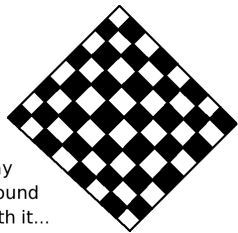
but why?

For this diagnostic, please follow these guidelines.

- Do not use a calculator at all.

- Do all the work of this diagnostic on a fresh piece of paper, writing neatly and showing lots of detail.

- Give yourself unlimited time.

- Once you are finished, you can check the answers with the ones that I provide.

- However, do not compare your answers to my answers for any question, until you are absolutely finished with the entire diagnostic.

Play Around With it...

0-5-1

Please solve the following equations for x.
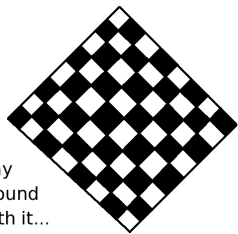
1. $2x - 1 = x + 7$.

2. $4x + 6 = 2x + 16$.

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

4. $10 + 6(5 - x) = -2(x - 12)$.

5. $\frac{2x+3}{2} = \frac{4+x}{6}$.
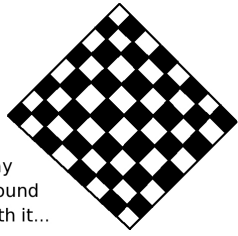
6. $\frac{9x-3}{3} = \frac{10-2x}{2}$.

Play Around With it...

0-5-2

Convert these equations to the $y = mx + b$ format.

7. $3x - 2y = 6$.

8. $3x + 5y - 6 = 2x + y$.

9. $(x/3) + (y/4) = 1$.

10. $y - 12 = 4(x - 6)$.

11. $\frac{3x+5y}{4} = 8x + y - 7$.
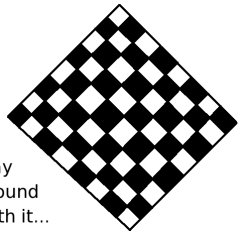
Does the point $(2, 3)$ lie on the following lines?

12. $y = -2x + 7$.

13. $y = 2x + 1$.

Play
Around
With it...

0-5-3

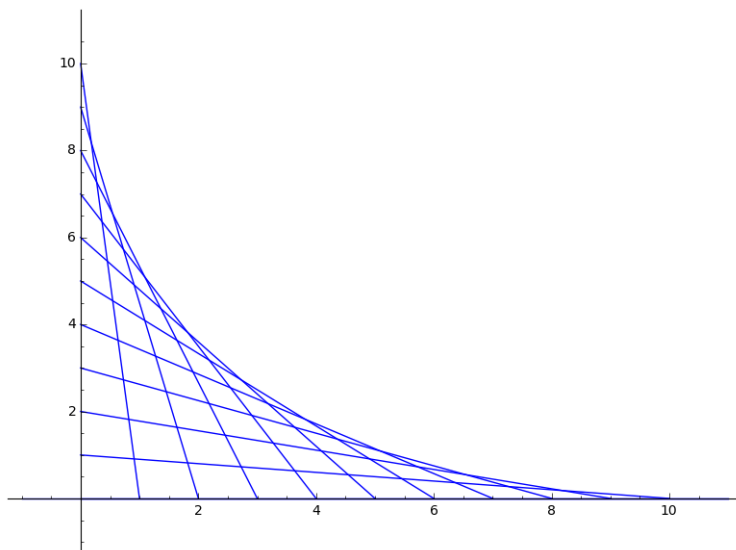Does the value $x = 2$ satisfy the following equations?
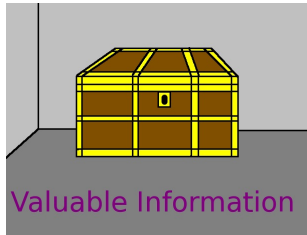
14. $9 = x^2 - 5x$.

15. $3 - 5x = -x^2 - 3$.

Play
Around
With it...

0-5-4

The answers can be found on the next page.

Check Your Work !!

1. $x = 8$

2. $x = 5$

3. $x = -3$

4. $x = 4$

5. $x = -1$

6. $x = 3/2$ or $x = 1.5$ or $x = 1\frac{1}{2}$ (any format is okay)

7. $y = \frac{3}{2}x - 3$ or $y = 1.5x - 3$ (any format is okay)

8. $y = \frac{-x}{4} + \frac{3}{2}$ or $y = \frac{x}{-4} + \frac{3}{2}$ or $y = -\frac{1}{4}x + \frac{3}{2}$

9. $y = -\frac{4}{3}x + 4$ or $y = \frac{-4}{3}x + 4$ or $y = \frac{4}{-3}x + 4$

10. $y = 4x - 12$

11. $y = 29x - 28$

12. Yes

13. No

14. No

15. Yes

Valuable Information

- If you have only 0, 1, or 2 questions wrong, then you've done well. Keep reviewing whatever Diagnostic Two requires you to review, and do not worry about Diagnostic Zero again.

- If you have 3 or more questions wrong, the main remedy is that you're going to take your work to your instructor. You are going to show the work to your instructor so that she or he can analyze your work and figure out what's what.

This completes Diagnostic Zero.