BLC

[redacted]190: Review for Quiz 1

Practice Quiz A

1. Solve the following equation:

$$x^2 = 8x - 12$$

$x^2 - 8x + 12 = 0$

$(x-6)(x-2) = 0$

$x - 6 = 0$ or $x - 2 = 0$

$\boxed{x = 6}$ or $\boxed{x = 2}$

2. Solve the following equation:

$$\frac{x}{x-1} - \frac{1}{x+3} = 0$$

$\frac{x(x+3)-(x-1)}{(x+3)(x-1)} = 0$

$\frac{x^2+3x-x+1}{(x+3)(x-1)} = 0$

$\frac{x^2+2x+1}{(x+3)(x-1)} = 0$

$x^2+2x+1 = 0$

$(x+1)(x+1) = 0$

$x+1 = 0$

$\boxed{x = -1}$

3. Recall that the quadratic formula is:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Use the quadratic formula to solve the following equation:

$$5x^2 + 3x - 7 = 0$$

$a = 5$

$b = 3$

$c = -7$

$x = \frac{-3 \pm \sqrt{3^2 - 4(5)(-7)}}{2(5)}$

$x = \frac{-3 \pm \sqrt{9 + 140}}{10}$

$\boxed{x = \frac{-3 \pm \sqrt{149}}{10}}$

4. Solve for y in the following equation:

$$x = \frac{5y - 4x}{3 - 2y}$$

$x(3-2y) = 5y-4x$

$3x - 2xy = 5y - 4x$

$-2xy - 5y = -4x - 3x$

$y(-2x-5) = -7x$

$y = \frac{-7x}{-2x-5}$ or $y = \frac{7x}{2x+5}$

either answer is Correct

5. Simplify the following expression. Your answer should be a fraction in lowest terms:

$$\frac{\frac{2}{x} - \frac{3}{x^2}}{x}$$

$= \frac{\frac{2x}{x^2} - \frac{3}{x^2}}{x} = \frac{\frac{2x-3}{x^2}}{x} = \frac{2x-3}{x^2} \div x$

$= \frac{2x-3}{x^2} \cdot \frac{1}{x} = \frac{2x-3}{x^3}$

6. Find all solutions to the following system of equations:

$$\begin{cases} x + y^2 = 1 \\ x + 3y = 3 \end{cases}$$

$x = 3 - 3y$

$(3 - 3y) + y^2 = 1$

$y^2 - 3y + 2 = 0$

$(y - 2)(y - 1) = 0$

$y - 2 = 0$ or $y - 1 = 0$

$y = 2$ or $y = 1$

if $y = 2$

then $x = 3 - 3y$

$x = 3 - 3(2)$

$x = -3$

if $y = 1$

then $x = 3 - 3y$

$x = 3 - 3(1)$

$x = 0$

Thus:

$x = -3$, $y = 2$

or

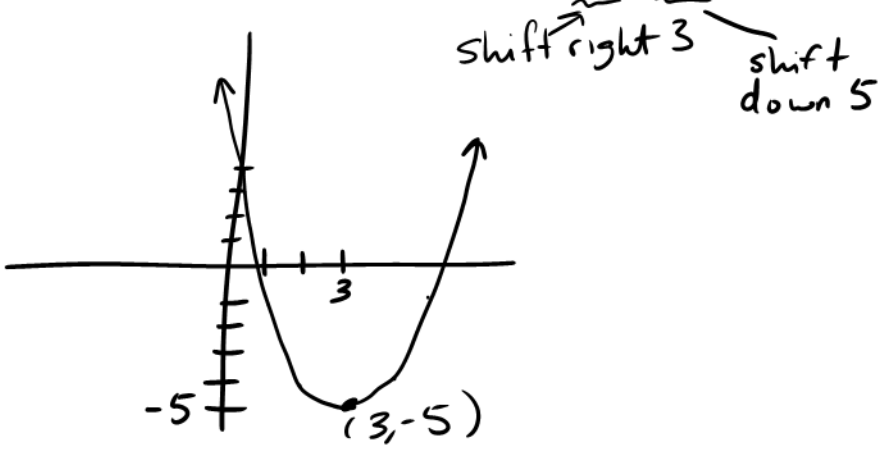
$x = 0$, $y = 1$

7. Rationalize the denominator:

$$\frac{y}{\sqrt{x} - \sqrt{y}} \cdot \frac{\sqrt{x} + \sqrt{y}}{\sqrt{x} + \sqrt{y}}$$

$$= \frac{y(\sqrt{x} + \sqrt{y})}{x - y}$$

8. Sketch the graph of the function $y = (x-3)^2 - 5$.



9. Find the equation for the line through the points $(3, -1)$ and $(6, 8)$.

$m = \frac{8+1}{6-3} = \frac{9}{3} = 3$

$y = 3(x-3) - 1$

or

$y = 3x - 10$

10. In 2000, the population of Red Hook was 1805, and in 2002, the population was 1824. Assuming that the population grows linearly, estimate the population of Red Hook in 2008.

$(2000, 1805)$

$(2002, 1824)$

$m = \frac{1824-1805}{2002-2000} = \frac{19}{2} = 9.5$

$y = 9.5(x - 2000) + 1805$

$x = 2008$

$y = 9.5(2008 - 2000) + 1805$

$y = 9.5(8) + 1805 = 76 + 1805 = \boxed{1881}$

Practice Quiz B

1. Solve the following equation:

$$(x+1)^2 = 3x + 7$$

$(x+1)(x+1) = 3x+7$

$x^2 + 2x + 1 = 3x + 7$

$x^2 - x - 6 = 0$

$(x-3)(x+2) = 0$

$x - 3 = 0$ or $x + 2 = 0$

$x = 3$ or $x = -2$

2. Solve the following equation:

$$\frac{1}{2x-1} - \frac{3}{x+4} = 0$$

$\frac{x+4-3(2x-1)}{(2x-1)(x+4)} = 0$

$\frac{x+4-6x+3}{(2x-1)(x+4)} = 0$

$\frac{-5x+7}{(2x-1)(x+4)} = 0$

$-5x + 7 = 0$

$-5x = -7$

$x = 7/5$

3. Recall that the quadratic formula is:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Use the quadratic formula to solve the following equation:

$$2x^2 = 4x + 5 \longrightarrow 2x^2 - 4x - 5 = 0$$

$a = 2$

$b = -4$

$c = -5$

$x = \frac{4 \pm \sqrt{4^2 - 4(2)(-5)}}{2(2)}$

$x = \frac{4 \pm \sqrt{16 + 40}}{4}$

$x = \frac{4 \pm \sqrt{56}}{4}$

4. Solve for y in the following equation:

$$5 = \sqrt{x^2 + y^2}$$

$25 = x^2 + y^2$

$y^2 = 25 - x^2$

$\boxed{y = \pm\sqrt{25 - x^2}}$

5. Simplify by subtracting the fractions. Your answer should be a fraction in lowest terms.

$$\frac{x-2}{x-2} \cdot \frac{1}{x+1} - \frac{3}{(x+1)(x-2)}$$

$\frac{x-2}{(x+1)(x-2)} - \frac{3}{(x+1)(x-2)} = \boxed{\frac{x-5}{(x+1)(x-2)}}$

6. Find all solutions to the following system of equations:

$$\begin{aligned} 3x + y &= 9 \\ 5x - 2y &= 4 \end{aligned}$$

$y = 9 - 3x$

$5x - 2(9 - 3x) = 4$

$5x - 18 + 6x = 4$

$11x - 18 = 4$

$11x = 22$

$\boxed{x = 2}$

$y = 9 - 3x$

$y = 9 - 3(2)$

$y = 9 - 6$

$\boxed{y = 3}$

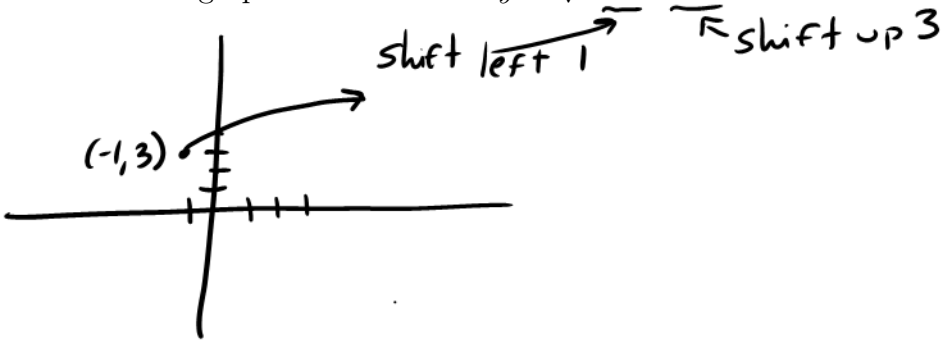
7. Rationalize the numerator:

$$\frac{\sqrt{x}+3}{x-9} \cdot \frac{\sqrt{x}-3}{\sqrt{x}-3}$$

$$= \frac{x-9}{(x-9)(\sqrt{x}-3)}$$

$$= \boxed{\frac{1}{\sqrt{x}-3}} \quad \text{if } x \neq 9$$

8. Sketch the graph of the function $y = \sqrt{x+1}+3$.



9. Find the equation for the line through the points $(-2, 3)$ and $(-2, 7)$.

$$m = \frac{7-3}{-2+2} = \frac{4}{0} \text{ undefined}$$

The equation for the line is $\boxed{x = -2}$

10. At age 7, Megan has 18 friends. Starting at age 7, she gains 10 friends a year (and never loses any friends). How many friends does she have at age x?

$$\#\text{friends} = 10(x-7)+18$$

$$= \boxed{10x-52}$$