

1. Solve the equation:  $\frac{x}{2} = \frac{x+7}{3}$

$$\begin{aligned} 3x &= 2(x+7) \\ 3x &= 2x + 14 \\ \boxed{x} &= \boxed{14} \end{aligned}$$

2. Solve the equation:  $\frac{x+2}{3} = \frac{2}{x+3}$

$$\begin{aligned} (x+2)(x+3) &= 6 \\ x^2 + 5x + 6 &= 6 \\ x^2 + 5x &= 0 \\ x(x+5) &= 0 \\ \boxed{x=0 \text{ or } x=-5} \end{aligned}$$

3. What are the similarities and differences between the equations in problems 1 and 2?

Problem #1 is a linear equation and problem #2 is a quadratic equation.

4. Perform the indicated operations:

a.  $\frac{2}{3} + \frac{5}{6}$

$$\frac{4}{6} + \frac{5}{6} = \frac{9}{6} = \boxed{\frac{3}{2}}$$

b.  $\frac{2}{3} - \frac{5}{6}$

$$\frac{4}{6} - \frac{5}{6} = \frac{-1}{6} = \boxed{\frac{-1}{6}}$$

c.  $\frac{2}{3} \cdot \frac{5}{6} = \frac{10}{18} = \boxed{\frac{5}{9}}$

d.  $\frac{2}{3} \div \frac{5}{6}$

$$\frac{2}{3} \cdot \frac{6}{5} = \boxed{\frac{4}{5}}$$

e.  $\frac{x+2}{3} + \frac{5x}{6}$

$$\frac{2(x+2)}{6} + \frac{5x}{6} = \frac{2x+4+5x}{6} = \boxed{\frac{7x+4}{6}}$$

f.  $\frac{x+2}{3} \cdot \frac{5x}{6}$

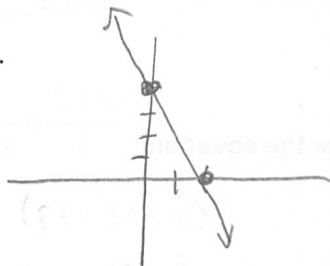
$$\begin{aligned} \frac{x+2}{3} \cdot \frac{5x}{6} &= \frac{5x(x+2)}{18} \\ &= \boxed{\frac{5x^2+10x}{18}} \end{aligned}$$

5. Find  $f(-3)$  and  $f(0)$  if  $f(x) = x^2 - 4x + 7$ . Check your answer using graphing technology and explain how you know you did or didn't correctly find  $f(-3)$  and  $f(0)$ .

$$\begin{aligned} f(-3) &= (-3)^2 - 4(-3) + 7 \\ f(-3) &= 9 + 12 + 7 \\ \boxed{f(-3)} &= \boxed{28} \end{aligned}$$

$$\begin{aligned} f(0) &= (0)^2 - 4(0) + 7 \\ \boxed{f(0)} &= \boxed{7} \end{aligned}$$

6. Write the equation of a line that contains the points  $g(0) = 4$  and  $g(2) = 0$ . What are the x and y intercepts of the  $g(x)$ .



$(0, 4)$   $(2, 0)$

$$y = -2x + 4$$

x-inter = 2  
y-inter = 4

7. Solve the equation:  $\frac{x+4}{5} = \frac{x+2}{x-2}$ .

$$(x+4)(x-2) = 5(x+2)$$

$$x^2 + 2x - 8 = 5x + 10$$

$$x^2 - 3x - 18 = 0$$

$$(x-6)(x+3) = 0$$

$$x = 6 \text{ or } x = -3$$

8. If a quadratic function has factors of  $x+7$  and  $2x-3$ , then write the equation in standard form ( $ax^2 + bx + c$ ). What are the zeros of the function?

$$\text{zeros are } -7 \text{ or } \frac{3}{2}$$

$$f(x) = (x+7)(2x-3)$$

$$= 2x^2 - 3x + 14x - 21$$

$$f(x) = 2x^2 + 11x - 21$$

9. Solve the equation:  $4 + 7(x-3) = 4(x+3) - (x+8)$

$$4 + 7x - 21 = 4x + 12 - x - 8$$

$$7x - 17 = 3x + 4$$

$$4x = 21$$

$$x = \frac{21}{4} \text{ or } 5\frac{1}{4}$$

10. What are the factors of  $g(x)$  and  $m(x)$ ?

a.  $g(x) = x^2 - 6x$

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

$$x \text{ or } x-6$$

b.  $m(x) = x^2 - 36$

$$(x+6)(x-6)$$