Math 9 Assignment 3: Algebra and Equations (solutions)

1. $3x = 12$
   $x = 4$

2. $15 = -2w$
   $w = -\frac{15}{2}$

3. $\frac{x}{4} = 7$
   $x = 28$

4. $5 = -\frac{b}{3}$
   $b = -15$

5. $\frac{3}{5} = \frac{\square}{20}$
   $5x = 60$
   $x = 12$

6. $\frac{5}{\square} = \frac{11}{6}$
   $11x = 30$
   $x = \frac{30}{11}$

7. $3x(5 - 3) = 2$
   $6x = 2$
   $x = 3$

8. $-3(2 - 7x) = 5$
   $-6 + 21x = 5$
   $21x = 11$
   $x = \frac{11}{21}$

9. $\frac{x}{4} = \frac{2}{7}$
   $7x = 8$
   $x = \frac{8}{7}$

10. $\frac{5}{7} = \frac{3}{x}$
    $5x = 21$
    $x = \frac{21}{5}$

11. $\frac{3}{x} = 9$
    $x = \frac{1}{3}$

12. $-2 = \frac{4}{t}$
    $t = -2$

13. $3 - x = 2(x + 5)$
$3 - x = 2x + 10$
$-7 = 3x$
$x = -\frac{7}{3}$

14. $-3(4x - 1) = 2 + x$
$-12x + 3 = 2 + x$
$1 = 13x$
$x = \frac{1}{13}$

15. $\frac{3}{x+2} = \frac{2}{3}$
$2x + 4 = 9$
$2x = 5$
$x = \frac{5}{2}$

16. $\frac{3x-2}{4} = \frac{-3}{4}$
$12x - 8 = -12$
$12x = -4$
$x = -\frac{4}{12} = -\frac{1}{3}$

17. $3 + \frac{2}{3} = \frac{1}{5-2x}$
$\frac{11}{3} = \frac{1}{5-2x}$
$55 - 22x = 3$
$52 = 22x$
$x = \frac{52}{22}$

18. $3x + \frac{x}{3} - 2 = 4$
Multiply by 3
$9x + x - 6 = 12$
$10x = 18$
$x = \frac{9}{5}$

19. $\frac{w}{2} - w + 3 = \frac{5}{2}$
Multiply by 2
$w - 2w + 6 = 5$
$1 = w$

20. $2 - 3x = 2 - \frac{2}{5}(x + 1)$

Multiply by 5

$10 - 15x = 10 - 2(x + 1)$

$-15x = -2x - 2$

$2 = 13x$

$x = \frac{2}{13}$

21. $5x - 3 = \frac{3}{5}\left(\frac{2x}{3} + 2\right)$

Multiply by 15

$75x - 45 = 9\left(\frac{2x}{3} + 2\right)$

$75x - 45 = 6x + 18$

$69x = 63$

$x = \frac{63}{69}$

22. See diagram below:

The front portion of the car is $\frac{3}{7}$ of its total length. If the remainder of the car is 200 cm, what is the length of the car?

$\frac{4}{7}x = 200$

$x = 200 \times \frac{7}{4} = 350 \text{ cm} = 3.5 \text{ m}$