Homework #17

Solve:

1. $x^2 + 3x - 130 = 0$

2. $x^2 = 9x$

3. $7x - 9 = 10x + 11$

4. $\dfrac{m + 3}{4} = m + 8$

5. $x + 5 = \dfrac{2x + 18}{x}$

6. $10x = x^2 - 39$

7. $(x - 2)^2 = 49$

8. $3(2 - x) = 4(1 + x)$

Solve:

9. $x + 3 = \dfrac{48}{x + 1}$

10. $4 = \sqrt{2 - t}$

11. $x = \dfrac{18}{x} + 7$

12. $8 - b^2 = 2b$

13. $\dfrac{3}{x + 2} = \dfrac{4}{x - 1}$

14. $\dfrac{x}{x + 5} = \dfrac{x}{x - 2}$

15. $\dfrac{k}{1 - k} = \dfrac{5}{k - 1}$

16. $3^{x + 1} = 81$

Make x the subject:

17. $y = \sqrt{x^2 + 6}$

18. $y = \dfrac{5}{x - 2}$

19. $y = {}^-5x + 3$

20. $y \le 2x + 7$

21. $y = (x - 7)^2$

22. $\dfrac{1}{k + 2} = \dfrac{t}{x - a}$

23. $y = \sqrt{\dfrac{\pi}{x^2}}$

24. $y = x^2 + 8x + 16$

Answers Homework #17

Solve:

1. $x^2 + 3x - 130 = 0$
   $(x - 10)(x + 13) = 0$
   $x = 10$ or $x = -13$

2. $x^2 = 9x$
   $x^2 - 9x = 0$
   $x(x - 9) = 0$
   $x = 0$ or $x = 9$

3. $7x - 9 = 10x + 11$
   $-20 = 3x$
   $x = {}^{-20}/_3$

4. $\dfrac{m + 3}{4} = m + 8$
   $m + 3 = 4m + 32$
   $-29 = 3m$
   $m = {}^{-29}/_3$

5. $x + 5 = \dfrac{2x + 18}{x}$
   $x^2 + 5x = 2x + 18$
   $x^2 + 3x - 18 = 0$
   $(x + 6)(x - 3) = 0$
   $x = -6$ or $x = 3$

6. $10x = x^2 - 39$
   $0 = x^2 - 10x - 39$
   $0 = (x - 13)(x + 3)$
   $x = 13$ or $x = -3$

7. $(x - 2)^2 = 49$
   $x^2 - 4x - 45 = 0$
   $(x - 9)(x + 5) = 0$
   $x = 9$ or $x = -5$

8. $3(2 - x) = 4(1 + x)$
   $6 - 3x = 4 + 4x$
   $2 = 7x$
   $x = {}^2/_7$

Solve:

9. $x + 3 = \dfrac{48}{x + 1}$
   $x^2 + 4x + 3 = 48$
   $x^2 + 4x - 45 = 0$
   $(x - 5)(x + 9) = 0$
   $x = 5$ or $x = -9$

10. $4 = \sqrt{2 - t}$
    $4^2 = 2 - t$
    $t = -14$

11. $x = \dfrac{18}{x} + 7$
    $x - 7 = \dfrac{18}{x}$
    $x^2 - 7x = 18$
    $(x - 9)(x + 2) = 0$
    $x = 9$ or $x = -2$

12. $8 - b^2 = 2b$
    $0 = b^2 + 2b - 8$
    $0 = (b - 2)(b + 4)$
    $b = 2$ or $b = -4$

13. $\dfrac{3}{x + 2} = \dfrac{4}{x - 1}$
    $3x - 3 = 4x + 8$
    $-11 = x$

14. $\dfrac{x}{x + 5} = \dfrac{x}{x - 2}$
    $x^2 - 2x = x^2 + 5x$
    $x = 0$

15. $\dfrac{k}{1 - k} = \dfrac{5}{k - 1}$
    $k^2 - k = 5 - 5k$
    $k^2 + 4k - 5 = 0$
    $(k + 5)(k - 1) = 0$
    $k = -5$ ~~or $k = 1$~~

16. $3^{x + 1} = 81$
    $x + 1 = 4$ as $3^4 = 81$
    $x = 3$

Make x the subject:

17. $y = \sqrt{x^2 + 6}$
    $y^2 = x^2 + 6$
    $y^2 - 6 = x^2$
    $x = \pm\sqrt{y^2 - 6}$

18. $y = \dfrac{5}{x - 2}$
    $(x - 2)y = 5$
    $x = \dfrac{5}{y} + 2$

19. $y = {}^-5x + 3$
    $y - 3 = -5x$
    $x = \dfrac{-y + 3}{5}$ $\left(= \dfrac{3 - y}{5} \right)$

20. $y \le 2x + 7$
    $y - 7 \le 2x$
    $x \ge \dfrac{y - 7}{2}$

21. $y = (x - 7)^2$
    $\pm\sqrt{y} = x - 7$
    $x = \pm\sqrt{y} + 7$

22. $\dfrac{1}{k + 2} = \dfrac{t}{x - a}$
    $x - a = t(k + 2)$
    $x = t(k + 2) - a$

23. $y = \sqrt{\dfrac{\pi}{x^2}}$
    $y^2 = \dfrac{\pi}{x^2}$
    $x^2 = \dfrac{\pi}{y^2}$
    $x = \pm\sqrt{\dfrac{\pi}{y^2}}$

24. $y = x^2 + 8x + 16$
    $y = (x + 4)^2$
    $\sqrt[2]{y} = x + 4$
    $x = \sqrt[2]{y} - 4$