1. Solve the following rational equations.

(a) $\dfrac{3}{x+5}+\dfrac{2}{x+3}=0$

(b) $\dfrac{8}{x+1}-\dfrac{2}{x+1}=0$

(c) $\dfrac{x+4}{2-x}+\dfrac{9}{2-x}=12$

(d) $\dfrac{x^2}{x-5}=20$

(e) $\dfrac{x}{2x+3}-\dfrac{7}{x-2}=\dfrac{x^2}{2x^2-x-6}$

(f) $\dfrac{x}{3x+1}+\dfrac{4}{x+2}=\dfrac{x^2}{3x^2+7x+2}$

(g) $\dfrac{6-x}{x-1}+\dfrac{1}{3x+1}=0$

(h) $\dfrac{2-2x}{x-7}=\dfrac{3}{2x-5}$

(i) $x-\dfrac{2}{x-3}=\dfrac{x-1}{3-x}$

(j) $\dfrac{2x}{x-1}+\dfrac{x-5}{x^2-1}=1$

(k) $\dfrac{2x}{x^2+x-12}-\dfrac{2}{x+4}=0$

(l) $\dfrac{x-2}{3x^2+x-4}-\dfrac{3}{x-1}=0$

(m) $\dfrac{x}{2x+5}=\dfrac{x^2}{2x^2+3x-5}$

(n) $\dfrac{3x}{4x-3}=\dfrac{3x^2}{4x^2+x-3}$

(o) $\dfrac{-11x+6}{x^3-27}+\dfrac{1}{x-3}=0$

(p) $\dfrac{1}{x^2-2x+4}=\dfrac{8-x^2}{x^3+8}$

(q) $\dfrac{5}{x+6}-\dfrac{1}{x^2+6x}=\dfrac{2}{x^2+6x}$

(r) $\dfrac{x^2-3x-4}{x^3-x^2}-\dfrac{1}{x^2}=\dfrac{x-2}{x^2}$

(s) $\dfrac{2}{x^2}-\dfrac{1}{x}=1$

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

(u) $\dfrac{1}{x+1}+\dfrac{2}{x^2-1}=1$

(v) $\dfrac{5}{x^2+x-12}+\dfrac{4}{x^2-x-20}=\dfrac{3}{x^2-8x+15}$

Answers

1. (a) $x = -\dfrac{19}{5}$

   (b) No solution.

   (c) $x = \dfrac{11}{13}$

   (d) $x = 10$

   (e) $x = -\dfrac{21}{16}$

   (f) $x = -\dfrac{2}{7}$

   (g) $x = -\dfrac{4}{3}\sqrt{6} + 3, x = \dfrac{4}{3}\sqrt{6} + 3$

   (h) $x = -\dfrac{3}{8}\sqrt{33} + \dfrac{11}{8}, x = \dfrac{3}{8}\sqrt{33} + \dfrac{11}{8}$

   (i) $x = -1$

   (j) $x = -4$

   (k) No solution.

   (l) $x = -\dfrac{7}{4}$

   (m) $x = 0$

   (n) $x = 0$

   (o) $x = 5$

   (p) $x = 2, x = -3$

   (q) $x = \dfrac{3}{5}$

   (r) $x = -5$

   (s) $x = -2, x = 1$

   (t) $x = 1 - \sqrt{3}, x = 1 + \sqrt{3}$

   (u) $x = 2$

   (v) $x = \dfrac{49}{6}$