

Unit 3 *Solving Equations*

Text Answers

3.1 Algebraic Fractions

1. (a) x^2 (b) $\frac{x+2}{x(x-2)}$ (c) $\frac{x-3}{x-2}$ (d) $\frac{2x-1}{x(x+1)}$
- (e) $\frac{x^2(x-6)}{x+6}$ (f) $\frac{1}{x}$ (g) $\frac{5x-3}{x}$ (h) $\frac{2x+1}{x}$ (i) $\frac{x-3}{x+2}$
2. (a) $\frac{1}{x}$ (b) x (c) $2x$ (d) x (e) $x(x-1)$
- (f) $x^2(x^2+x+1)$ (g) $\frac{x}{x-1}$ (h) $\frac{x(x+2)(x-2)}{(x-4)(x+1)}$ (i) $\frac{x-3}{x+1}$
- (j) $\frac{x(x+4)}{x-2}$ (k) $\frac{x+5}{x-3}$ (l) $\frac{x(x-2)}{x+1}$ (m) $\frac{(x-1)}{x(x-3)}$
- (n) $\frac{x(x-1)}{x+8}$ (o) $\frac{x-5}{x(x+6)}$ (p) $\frac{5x-6}{x+1}$ (q) $\frac{5x-2}{x-7}$
- (r) $\frac{3x+1}{5x+1}$ (s) $\frac{2x-7}{3x+2}$ (t) $\frac{4x-3}{5x-1}$ (u) $\frac{x(3x+2)}{4x+3}$
3. (a) $\frac{x}{x+4}$ (b) $\frac{x-1}{x(x+1)}$ (c) $\frac{(x+2)^2}{x}$ (d) $\frac{3}{x^2(x+2)}$ (e) $\frac{(x+3)^2}{x^3}$
- (f) $x(x+3)$ (g) $\frac{x^2(x-1)}{x+1}$ (h) $\frac{x^3(x+1)}{(x+4)^2}$ (i) $\left(\frac{x+3}{x-4}\right)^2$
4. (a) $\frac{3x-1}{(x+2)(x-5)}$ (b) $\frac{-x-14}{(x+2)(x-1)}$ (c) $\frac{x}{(x+1)(x-1)}$
- (d) $\frac{8}{x+2}$ (e) $\frac{x+4}{(x+3)(x-3)}$ (f) $\frac{3(3x-13)}{(x-3)(x-6)}$
- (g) $\frac{6x}{(x-4)(x+2)}$ (h) $\frac{x(x-1)}{x+1}$ (i) $\frac{2x^2+3x-24}{(x-6)(2x-1)}$ (j) $\frac{x(5x-14)}{(x+2)(x-6)}$
- (k) $\frac{x(2x-1)}{(x-1)(x+1)}$ (l) $\frac{x^2+8x+1}{x^2}$ (m) $\frac{x(x+9)}{(x+6)(x+7)}$
- (n) $\frac{2x^2+11x+11}{(x+2)(x+3)}$ (o) $\frac{2x^2-7x-17}{(x+1)(x+2)}$
5. (a) $x+1$ (b) $4b+2a=2(2b+a)$

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3.2 Algebraic Fractions and Quadratic Equations

1. Both answers are 4
2. 4 and -1
3. 5 and 15
4. 2 and $\frac{-2}{3}$
5. 3 and -5
6. 7 and $\frac{1}{4}$
7. 2 and $\frac{-23}{9}$
8. 10 and $\frac{-5}{2}$
9. 3 and $\frac{1}{3}$
10. 2 and $\frac{-48}{7}$
11. 8 and $\frac{5}{2}$
12. 1 and $\frac{9}{4}$
13. $\frac{-9 \pm \sqrt{113}}{8}$
14. 3 and $\frac{44}{3}$
15. $\frac{35 \pm \sqrt{1605}}{10}$

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3.3 Algebraic Solution of Simultaneous Equations – One Linear and One Quadratic

1. (a) $x = 4, y = 12$ and $x = -1, y = -3$

(b) $x = -5, y = 0$ and $x = 2, y = 14$

(c) $x = 2, y = 7$ and $x = -1, y = -2$

2. (a) $x = 2.62, y = 6.85$ and $x = 0.38, y = 0.15$

(b) $t = -0.55, x = 8.30$ and $t = -5.45, x = 37.70$

(c) $x = 0.28, y = -0.43$ and $x = -5.28, y = -11.57$

3. (a) $x = 0, y = 1$ and $x = 4, y = -1$

(b) $x = 3, y = 7$ and $x = 3.4, y = 5.4$

(c) $x = 3, y = 6$ and $x = -1.4, y = 23.6$

4.

x	-3	-2	-1	0	1	2	3	4
$y = 9 - x^2$	0	5	8	9	8	5	0	-7

(e) $(-1, 8)$ and $(3, 0)$

(f) $x = -1, y = 8$ and $x = 3, y = 0$

5. (a) $x = 3, y = 4$ and $x = 0, y = -5$

(b) $x = 3, y = 6$ and $x = -3, y = -6$

(c) $x = -2, y = 2$ (There is only one solution here which means that the line is actually a tangent to the circle.)

(d) $x = 2, y = 8$ and $x = -3.2, y = -7.6$

(e) $x = -4, y = -3$ and $x = 3, y = -4$

(f) $x = 3.11, y = -3.22$ and $x = -0.71, y = 4.42$

6. $(4.65, -0.65)$ and $(-0.65, 4.65)$

7. (d) P (10, 0) and Q (-10, 0)

(e) R $(\sqrt{10}, 3\sqrt{10})$

(f) $30\sqrt{10}$ units²

(h) $\frac{3}{1 - \sqrt{10}}$