

WITHOUT CALCULATOR

Solve the following equations or inequalities for the variable:

1. $\frac{x}{3} = 5$

2. $7 - 2x = x - 14$

3. $3x - 9 = 7 + 2x - x$

4. $3.6y = 5.4 + 3.3y$

5. $6.5 - 7y = 2y + 2$

6. $\frac{x + 6}{3} = 9$

7. $-\frac{2}{5}n = -10$

8. $\frac{1}{2}a - \frac{1}{3}a = -2$

9. $\frac{1}{6} = \frac{2}{3}x - \frac{1}{2}$

10. $\frac{2}{3}x - \frac{3}{4} = \frac{3}{4}x$

11. $3x + 90 < 30$

12. $90 < 5y + 45 < 180$

13. $\frac{x + 5 + 4(x - 1) + 2x}{3} = 12$

14. $10 - 2(3x - 2) = 20$

15. $\frac{6}{x - 4} = \frac{3}{4}$

16. $180 \geq 3(90 - x) - 60$

17. $-18 < 2(12 - 3x)$

18. $-6 - 3(2x + 4) \geq 18$

19. $.5(2x - 4) \leq -17$

20. $\frac{2}{5}(5x + 35) - 8 = 12$

Answers to Review I

1. 15

2. 7

3. 8

4. 18

5. .5

6. 21

7. 25

8. -12

9. 1

10. -9

11. $x < -20$

12. $9 < y < 27$

13. 5

14. -1

15. 12

16. $x \geq 10$

17. $x < 7$

18. $x \leq -6$

19. $x \leq -15$

20. 3

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WITHOUT CALCULATOR

Factor if possible:

1. $x^2 - 6x$

2. $x^2 - 9$

3. $x^2 + 16$

4. $x^2 - 5x + 6$

5. $x^2 + 5x - 6$

6. $x^2 - x - 20$

Solve each equation:

1. $\sqrt{x} = 4$

2. $x^2 = 4$

3. $x^2 + 10x = 0$

4. $x^2 - 25 = 0$

5. $x^2 - 2x - 35 = 0$

6. $x^2 + 4 + 10 - 3x = 54$

Find each product:

1. $(x + 3)(2x - 5)$

2. $(3x - 7)(x + 5)$

3. $(a - 6)(a + 8)$

4. $(4x - 7)(2x - 5)$

Simplify:

1. $\frac{x^2 - 7x + 12}{x^2 - 16}$

2. $\frac{x^2 - 4x - 12}{x^2 - 36}$

Find the ratio of x to y:

1. $ax + by = cx - dy$

2. $-3y + 2x = -5x - 4y$

3. $cy - dx = ex + fy$

4. $wx - zy = 5x + 2y$

Answers to Review II

Factor Answers:

1. $x(x - 6)$

2. $(x + 3)(x - 3)$

3. nonfactorable

4. $(x - 3)(x - 2)$

5. $(x + 6)(x - 1)$

6. $(x - 5)(x + 4)$

Solve answers:

1. 16

2. 2, -2

3. -10, 0

4. -5, 5

5. -5, 7

6. -5, 8

Product answers:

1. $2x^2 + x - 15$

2. $3x^2 + 8x - 35$

3. $a^2 + 2a - 48$

4. $8x^2 - 34x + 35$

Simplify answers:

1. $\frac{x - 3}{x + 4}$

2. $\frac{x + 2}{x + 6}$

Ratio answers:

1. $\frac{d + b}{c - a}$

2. $\frac{-1}{7}$

3. $\frac{c - f}{d + e}$

4. $\frac{z + 2}{w - 5}$

WITHOUT CALCULATOR

Solve each system:

$$\begin{aligned} 1. \quad x &= 3y + 2 \\ x + 2y &= 12 \end{aligned}$$

$$\begin{aligned} 2. \quad y &= 4x - 3 \\ 3x + 2y &= -17 \end{aligned}$$

$$\begin{aligned} 3. \quad 5x - 3y &= 11 \\ 2x - 4y &= 10 \end{aligned}$$

$$\begin{aligned} 4. \quad 6x + 3y &= 27 \\ -4x + 7y &= -27 \end{aligned}$$

$$\begin{aligned} 5. \quad 4x - 7y &= -15 \\ -4x - 3y &= -15 \end{aligned}$$

$$\begin{aligned} 6. \quad 9x + 3y &= 2 \\ -9x - y &= 0 \end{aligned}$$

Solve for the given variable:

$$\begin{aligned} 7. \quad \text{Solve for } x: \\ b + x + a &= 2x + a \end{aligned}$$

$$\begin{aligned} 8. \quad \text{Solve for } a: \\ \frac{d}{x} &= \frac{a}{m} \end{aligned}$$

$$\begin{aligned} 9. \quad \text{Solve for } w: \\ 2a - 3(4b - w) &= 8y \end{aligned}$$

$$\begin{aligned} 10. \quad \text{Solve for } h: \\ x(a + h) &= r \\ \text{Leave answer in} \\ &2 \text{ different forms.} \end{aligned}$$

Simplify completely:

$$11. \quad \frac{8}{0}$$

$$12. \quad \frac{3x + 6}{3}$$

$$13. \quad \frac{5 + 30x}{5}$$

$$14. \quad \frac{4}{4 + 8x}$$

$$15. \quad \frac{8}{\frac{2}{3}}$$

$$16. \quad \frac{\frac{2}{5}}{20}$$

Answers to Review III

1. $(8, 2)$

2. $(-1, -7)$

3. $(1, -2)$

4. $(5, -1)$

5. $(\frac{3}{2}, 3)$

6. $(-\frac{1}{9}, 1)$

7. $x = b$

8. $a = \frac{dm}{x}$

9. $w = \frac{8y - 2a + 12b}{3}$

10. $h = \frac{r - ax}{x}$ or $h = \frac{r}{x} - a$

11. undefined

12. $x + 2$

13. $1 + 6x$

14. $\frac{1}{1 + 2x}$

15. 12

16. $\frac{1}{50}$

WITHOUT CALCULATOR

Solve the following equations:

1. $\frac{2}{3}(3x - 12) = 10$

2. Solve for w:

$$\frac{4}{3}x - 6w = \frac{9p}{2}$$

Leave answer in 2 different forms.

3. Solve: $\frac{3}{4}(6 - x) \leq 12$

4. Solve: $\frac{1}{2}x^2 + \frac{7}{2}x + 5 = 0$

5. Reduce and leave answer in 2 forms:

$$\frac{2}{3}x - \frac{4}{5} + \frac{x}{2}$$

6. Solve the system:

$$\frac{1}{4}x + \frac{1}{2}y = \frac{1}{2}$$

$$\frac{6}{5}x - \frac{3}{5}y = \frac{-33}{5}$$

7. What is the negative reciprocal of -1 ?

8. Simplify completely:

$$\frac{6c - (-9c)}{2f - 5f}$$

9. Simplify completely:

$$\frac{4m - 12a}{8m - 6a}$$

10. Simplify completely:

$$x^2 \cdot x^4$$

11. Simplify completely:

$$(x^2)^4$$

12. Simplify completely:

$$6x(x^2 - 2x)$$

13. Solve: $|x| = 4$

14. Solve: $|x - 2| = 9$

15. Solve: $|x| - 2 = 9$

16. Solve: $|3x + 7| = 16$

Answers to Review IV

1. 9

2. $w = -\frac{3}{4}p + \frac{2}{9}x$

$$w = \frac{-27p + 8x}{36}$$

3. $x \geq -10$

4. $\{-5, -2\}$

5. $\frac{7}{6}x - \frac{4}{5}$
 $\frac{35x - 24}{30}$

6. $(-4, 3)$

7. 1

8. $\frac{-5c}{f}$

9. $\frac{2m - 6a}{4m - 3a}$

10. x^6

11. x^8

12. $6x^3 - 12x^2$

13. $-4, 4$

14. $-7, 11$

15. $-11, 11$

16. $3, -\frac{23}{3}$

WITHOUT CALCULATOR

Solve each quadratic:

1. $x(x + 2) = 8$

2. $\frac{n(n - 3)}{2} = 14$

Simplify each radical expression completely:

3. $\sqrt{24}$

4. $\sqrt{3} \cdot \sqrt{6}$

5. $\frac{\sqrt{12}}{\sqrt{3}}$

6. $\frac{\sqrt{5}}{\sqrt{2}}$

7. $\frac{6}{\sqrt{3}}$

8. $3\sqrt{2} + \sqrt{8} + 10$

Use the quadratic formula to solve each problem:

9. $x^2 + 3x - 10 = 0$

10. $-2x^2 + 3x - 1 = 0$

11. $2x^2 + 6x = 3$

12. $3x^2 = 6x - 2$

Simplify, if possible:

13. $\sqrt{m^2n^2}$

14. $\sqrt{m^2 + n^2}$

15. $\sqrt{(m + n)^2}$

16. $\sqrt{\frac{m^2}{n^2}}$

Multiply and combine like terms:

17. $(m + 4)(m - 4)$

18. $(2y + 3)^2$

Answers to Review V

1. $\{-4, 2\}$

2. $\{-4, 7\}$

3. $2\sqrt{6}$

4. $3\sqrt{2}$

5. 2

6. $\frac{\sqrt{10}}{2}$

7. $2\sqrt{3}$

8. $5\sqrt{2} + 10$

9. $\{-5, 2\}$

10. $\left\{\frac{1}{2}, 1\right\}$

11. $\left\{\frac{-3 \pm \sqrt{15}}{2}\right\}$

12. $\left\{\frac{3 \pm \sqrt{3}}{3}\right\}$

13. $|mn|$

14. does not simplify

15. $|m + n|$

16. $\left|\frac{m}{n}\right|$

17. $m^2 - 16$

18. $4y^2 + 12y + 9$