

1. Solve the following linear inequality  $5x - 1 < 2x + 4 \leq 5x + 3$ .

A.  $\frac{5}{3} < x \leq \frac{1}{3}$

B.  $-\frac{8}{3} \leq x < -\frac{4}{3}$

C.  $\frac{11}{3} < x \leq \frac{7}{3}$

D.  $-\frac{4}{3} < x \leq -\frac{8}{3}$

E.  $\frac{2}{3} < x \leq -\frac{2}{3}$

F.  $\frac{7}{3} \leq x < \frac{11}{3}$

G.  $\frac{1}{3} \leq x < \frac{5}{3}$

H.  $-\frac{2}{3} \leq x < \frac{2}{3}$

2. Simplify the expression.  $\frac{10t^3}{4t^7}$

A.  $\frac{35t}{6}$

B.  $\frac{5}{2t^4}$

C.  $\frac{5}{2t^{21}}$

D.  $\frac{5t^{10}}{2}$

E.  $\frac{35}{6t}$

F.  $\frac{5t^4}{2}$

G.  $\frac{5t^{21}}{2}$

H.  $\frac{5}{2t^{10}}$

3. Solve the equation.  $18\beta^2 + 9\beta = 5$

A.  $\beta = 6$  or  $\beta = -\frac{8}{5}$

B.  $\beta = -6$  or  $\beta = \frac{8}{5}$

C.  $\beta = \frac{5}{6}$  or  $\beta = -\frac{7}{8}$

D.  $\beta = \frac{1}{3}$  or  $\beta = \frac{5}{6}$

E.  $\beta = \frac{8}{5}$  or  $\beta = -\frac{4}{7}$

F.  $\beta = \frac{8}{5}$  or  $\beta = \frac{4}{7}$

G.  $\beta = \frac{1}{3}$  or  $\beta = -\frac{5}{6}$

H.  $\beta = \frac{5}{6}$  or  $\beta = \frac{7}{8}$

4. Factor the following quadratic polynomial.  $15\alpha^2 - 28\alpha z + 12z^2$

A.  $(5\alpha - z)(3\alpha + 12z)$

B. Not factorable. This trinomial is prime.

C.  $(5\alpha + z)(3\alpha - 12z)$

D.  $(5\alpha - 6z)(3\alpha + 2z)$

E.  $(15\alpha - 6z)(\alpha + 2z)$

F.  $(5\alpha - 6z)(3\alpha - 2z)$

G.  $(15\alpha + 6z)(\alpha - 2z)$

H.  $(5\alpha + 6z)(3\alpha - 2z)$

5. Solve the following linear system by substitution.  $\begin{cases} 3x - 5y = 2 \\ -x + 2y = 1 \end{cases}$

A. There is no solution.

B. (5, 1).

C. (6, 2).

D. There are infinitely many solutions.

E. (9, 5).

F. (10, 6).

G. (7, 3).

H. (13, 9).

6. Solve the following linear system by the addition method.  $\left\{ \begin{array}{l} -\frac{x}{16} + \frac{y}{8} = \frac{3}{32} \\ \frac{x}{2} + \frac{y}{4} = \frac{1}{4} \end{array} \right\}$

A.  $(\frac{31}{10}, \frac{19}{5})$ .

B.  $(\frac{41}{10}, \frac{24}{5})$ .

C. There are infinitely many solutions.

D.  $(\frac{1}{10}, \frac{4}{5})$ .

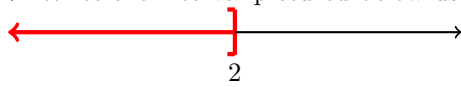
E.  $(-\frac{9}{10}, -\frac{1}{5})$ .

F.  $(-\frac{29}{10}, -\frac{11}{5})$ .

G. There is no solution.

H.  $(-\frac{39}{10}, -\frac{16}{5})$ .

7. Write the interval pictured below using inequality symbols.



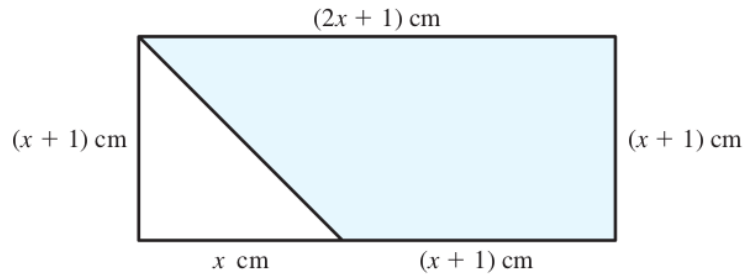
A.  $x \leq 2$

B.  $x > 2$

C.  $x < 2$

D.  $x \geq 2$

8. Write a polynomial for the area of the shaded part of the figure below.



- A.  $\frac{3x^2}{4} + \frac{5x}{2} + 1$
- B.  $\frac{3x^2}{2} + \frac{5x}{2} + 1$
- C.  $\frac{3x^2}{2} + \frac{5x}{4} + 1$
- D.  $\frac{3x^2}{2} + \frac{5x}{4} + 2$
- E.  $\frac{3x^2}{2} + \frac{5x}{2} + 2$



9. Simplify the expression using the product rule for square roots.  $\sqrt{6600}$

A.  $30\sqrt{2}$

B.  $3\sqrt{15}$

C.  $10\sqrt{66}$

D.  $2\sqrt{3}$

E.  $\sqrt{110}$

F.  $3\sqrt{21}$

G.  $\sqrt{70}$

H.  $6\sqrt{5}$

10. Solve the following linear inequality  $-4x + 4 < 3x + 1$ .

A.  $x > \frac{3}{14}$

B.  $x > -\frac{6}{7}$

C.  $x > -\frac{3}{28}$

D.  $x > \frac{3}{7}$

E.  $\frac{1}{7} < x$

F.  $x > \frac{12}{7}$

G.  $x > -\frac{12}{7}$

H.  $\frac{6}{7} < x$

11. Simplify the expression.  $\left[ \frac{(\beta^6 \cdot q^{-7})^{-5} (\beta^4 \cdot q^3)^{-4}}{(\beta^7 \cdot q^{-8})^{-3}} \right]^8$

A.  $\beta^{-320} q^{-128}$

B.  $\beta^{-112} q^{80}$

C.  $\beta^{-144} q^{48}$

D.  $\beta^{-56} q^{136}$

E.  $\beta^{-64} q^{128}$

F.  $\beta^{-216} q^{-24}$

G.  $\beta^{-312} q^{-120}$

H.  $\beta^{-200} q^{-8}$

12. Solve the following equation  $|2x + 4| = 5$ .

A.  $-2$  or  $-\frac{27}{2}$

B.  $\frac{1}{6}$  or  $\frac{3}{2}$

C.  $-\frac{1}{6}$  or  $\frac{9}{2}$

D.  $\frac{1}{2}$  or  $-\frac{9}{2}$

E.  $-\frac{1}{8}$  or  $-\frac{9}{4}$

F.  $1$  or  $-\frac{3}{2}$

G.  $2$  or  $\frac{9}{4}$

H.  $-\frac{1}{2}$  or  $-18$

13. Factor out the GCF.  $15\xi^4\gamma^2 - 16\xi^4\gamma^3$

A.  $\xi\gamma^3(2 - 3\xi^4\gamma)$

B.  $\xi\gamma^3(\xi^4\gamma - 4)$

C.  $2\xi\gamma^2(3\xi^4 - \gamma^2)$

D.  $\xi^2\gamma(\xi^3 - 3\gamma^4)$

E.  $\xi^2\gamma^4(3\xi^2 - \gamma)$

F.  $\xi^4\gamma^2(\xi - 3\gamma^3)$

G.  $\xi^3\gamma^4(\xi\gamma^3 - 4)$

H.  $\xi^4\gamma^2(15 - 16\gamma)$

14. Completely factor using the forms for perfect square trinomials.  $25\beta^2 + 20\beta + 4$

A.  $(2\beta + 5)(2\beta + 4)$

B. Not factorable. This trinomial is prime.

C.  $(5\beta + 4)(5\beta + 7)$

D.  $(3\beta + 4)(9\beta + 7)$

E.  $(5\beta + 1)(5\beta + 4)$

F.  $(25\beta + 2)(\beta + 2)$

G.  $(5\beta + 2)(5\beta + 2)$

H.  $(3\beta + 2)(9\beta + 2)$

15. Complete the square by filling in the missing number.  $a^2 + \frac{7}{5}a + \underline{\hspace{2cm}}$

A.  $\frac{9}{100}$

B.  $\frac{1}{25}$

C.  $\frac{49}{100}$

D.  $\frac{9}{64}$

E.  $\frac{1}{36}$

F.  $\frac{25}{16}$

G.  $\frac{1}{64}$

H.  $\frac{25}{64}$

16. The polynomial expression  $A^2 + B^2$  is

A. a difference of two squares

B. a sum of two squares

C. a square of a difference

D. a square of a sum



17. Factor the following quadratic polynomial.  $v^2 - 8v + 12$

A.  $(v + 2)(v + 9)$

B.  $(v - 2)(v + 9)$

C. Not factorable. This trinomial is prime.

D.  $(v + 6)(v - 2)$

E.  $(v - 6)(v + 2)$

F.  $(v + 8)(v + 4)$

G.  $(v - 6)(v - 2)$

H.  $(v + 6)(v + 2)$

18. Solve the quadratic equation. Leave the radical unsimplified.  $-2z^2 = 4z + 9$

A.  $z = \frac{4 \pm \sqrt{15}}{-4}$

B.  $z = \frac{-4 \pm \sqrt{144}}{-4}$

C.  $z = \frac{-4 \pm \sqrt{124}}{4}$

D. This equation has no real number solutions.

E.  $z = \frac{4 \pm \sqrt{188}}{-4}$

F.  $z = \frac{-4 \pm \sqrt{1}}{-4}$

G.  $z = \frac{4 \pm \sqrt{56}}{-4}$

H.  $z = \frac{-4 \pm \sqrt{169}}{4}$

19. Calculate the slope of a line which is parallel to the line passing through the points  $(-2, -5)$  and  $(-4, 1)$

A.  $-\frac{15}{4}$

B.  $-\frac{17}{6}$

C.  $-\frac{5}{2}$

D.  $-3$

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

F.  $-\frac{13}{6}$

G.  $-\frac{19}{6}$

H. Undefined

20. Simplify the expression.  $(2\beta^4 \cdot 2\beta^6)^3$

A.  $12\beta^{10}$

B.  $64\beta^{13}$

C.  $64\beta^{30}$

D.  $4\beta^{30}$

E.  $12\beta^{30}$

F.  $4\beta^{13}$

G.  $4\beta^{13}$

H.  $24\beta$

## Answers

1. G.

2. B.

3. G.

4. F.

5. E.

6. D.

7. A.

8. B.

9. C.

10. D.

11. H.

12. D.

13. H.

14. G.

15. C.

16. B.

17. G.

18. D.

19. D.

20. C.