1. Expand the square. $(\gamma - 6)^2$

A. $\gamma^2 - 12\gamma + 36$

B. $\gamma^2 + 36$

C. $\gamma^2 - 36$

D. $36\gamma^2 - 1$

E. $\gamma^2 + 12\gamma - 36$

2. Factor the following quadratic polynomial. $b^2 + 6b - 27$

A. $(b + 9)(b - 3)$

B. $(b - 4)(b - 10)$

C. $(b + 4)(b + 10)$

D. $(b - 9)(b + 3)$

E. Not factorable. This trinomial is prime.

F. $(b - 4)(b + 10)$

G. $(b + 9)(b + 3)$

H. $(b + 4)(b - 10)$

3. Solve the following inequality $|5(-5x+2)+1(4x-4)| \geq 3$.

A. $-\frac{3}{14} \leq x \leq \frac{1}{21}$

B. $\frac{1}{7} \leq x \leq \frac{3}{7}$

C. $x \leq -\frac{12}{7}$ or $x \geq -\frac{3}{7}$

D. $-\frac{4}{7} \leq x \leq \frac{9}{7}$

E. $x \leq -\frac{3}{14}$ or $x \geq \frac{1}{21}$

F. $x \leq -\frac{4}{7}$ or $x \geq \frac{9}{7}$

G. $-\frac{12}{7} \leq x \leq -\frac{3}{7}$

H. $x \leq \frac{1}{7}$ or $x \geq \frac{3}{7}$

4. Solve the quadratic equation and completely simplify your answer. $4\alpha^2 + 12\alpha - 21 = 0$

A. $\alpha = \frac{3 \pm 2\sqrt{15}}{2}$

B. $\alpha = \frac{-3 \pm \sqrt{30}}{2}$

C. $\alpha = \frac{3 \pm \sqrt{6}}{2}$

D. $\alpha = \frac{3 \pm 1}{2}$

E. $\alpha = \frac{-3 \pm 3\sqrt{5}}{2}$

F. $\alpha = \frac{3 \pm 6\sqrt{5}}{2}$

G. $\alpha = \frac{-3 \pm 2\sqrt{15}}{2}$

H. $\alpha = \frac{-3 \pm 2\sqrt{5}}{2}$

5. Billy Bob is mixing up a batch of his famous "Mother Lode Mountain Punch." Here's Billy Bob's secret recipe:

1) Lots of sugar. 2) Several Kool Aid drink mix packets. 3) Pure mountain spring water. 4) Bourbon.

Now, Billy Bob is a bright, well-liked fellow, but he doesn't remember any algebra, so he needs a little help. Billy Bob is planning a hootenanny and needs to know how much of the mixed Sugar Kool Aid drink (no alcohol) and bourbon (40 percent alcohol) he needs to mix together to make 30 gallons of Mother Lode Mountain Punch which is 12 percent alcohol. Write a system of two equations in two unknowns which models this situation.

A. The system is $\left\{ \begin{array}{c} 0 \cdot x + y = 0.12 \cdot 30 \\ 0.4x + y = 0.12 \cdot 30 \end{array} \right\}$.

B. The system is $\left\{ \begin{array}{c} 0 \cdot x + y = 30 \\ 0.4x + y = 0.12 \cdot 30 \end{array} \right\}$.

C. The system is $\left\{ \begin{array}{c} 0 \cdot x + y = 0.12 \cdot 30 \\ x + 0.4y = 30 \end{array} \right\}$.

D. The system is $\left\{ \begin{array}{c} x + y = 30 \\ 0 \cdot x + 0.4y = 30 \end{array} \right\}$.

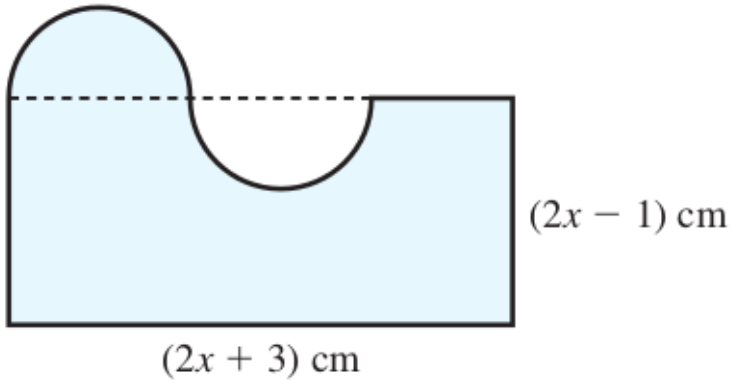
E. The system is $\left\{ \begin{array}{c} 0 \cdot x + y = 0.12 \cdot 30 \\ 0.4x + y = 30 \end{array} \right\}$.

F. The system is $\left\{ \begin{array}{c} x + y = 0.12 \cdot 30 \\ 0 \cdot x + 0.4y = 30 \end{array} \right\}$.

G. The system is $\left\{ \begin{array}{c} x + y = 30 \\ 0 \cdot x + 0.4y = 0.12 \cdot 30 \end{array} \right\}$.

H. The system is $\left\{ \begin{array}{c} 0 \cdot x + 0.12y = 30 \\ 0.4x + 0.12y = 30 \end{array} \right\}$.

6. Write a polynomial for the area of the figure below.



A. $4x^2 + 2x - 3$

B. $4x^2 - 4x - 3$

C. $4x^2 + 4x - 3$

D. $4x^2 + 2x + 3$

E. $4x^2 + 4x + 3$

7. Use the slope-intercept form of each line to determine the number of solutions of the system $\left\{ \begin{array}{l} -2x + y = 2 \\ 6x - 2y = -2 \end{array} \right\}$; then classify each system as a consistent system of independent equations, an inconsistent system, or a consistent system of dependent equations.

A. The system has one solution. Therefore, it is an inconsistent system of dependent equations.

B. The system has two solutions. Therefore, it is a inconsistent system of dependent equations.

C. The system has no solutions. Therefore, it is a consistent system of independent equations.

D. The system has no solutions. Therefore, it is an inconsistent system of equations.

E. The system has two solutions. Therefore, it is a consistent system of independent equations.

F. The system has one solution. Therefore, it is a consistent system of independent equations.

G. The system has infinitely many solutions. Therefore, it is an inconsistent system of dependent equations.

H. The system has infinitely many solutions. Therefore, it is a consistent system of dependent equations.

8. Factor the polynomial by grouping. $\phi^3 + 5\phi^2 + \phi + 5$

A. $(\phi^2 + 5)(\phi + 1)$

B. $(\phi^2 + 5)(\phi - 1)$

C. $(\phi + 5)(\phi^2 - 1)$

D. $(\phi - 5)(\phi^2 + 1)$

E. $(\phi^2 - 5)(\phi + 1)$

F. $(\phi + 5)(\phi + 1)(\phi - 1)$

G. $(\phi + 5)(\phi^2 + 1)$

H. $(\phi^2 - 5)(\phi - 1)$

9. Factor the following quadratic polynomial. $40\theta^2 + 8\theta - 1$

A. $(2\theta - 1)(20\theta - 1)$

B. $(4\theta - 1)(10\theta - 1)$

C. $(40\theta + 1)(\theta + 1)$

D. $(40\theta - 1)(\theta + 1)$

E. $(2\theta + 1)(20\theta - 1)$

F. $(5\theta + 1)(8\theta + 1)$

G. Not factorable. This trinomial is prime.

H. $(5\theta - 1)(8\theta + 1)$

10. Solve the equation. $6s^2 + 14s + 4 = 0$

A. $s = 2$ or $s = \frac{3}{4}$

B. $s = -2$

C. $s = -\frac{1}{3}$ or $s = -2$

D. $s = 2$ or $s = \frac{5}{6}$

E. $s = -2$ or $s = -\frac{3}{4}$

F. $s = -2$ or $s = -\frac{5}{6}$

G. $s = 2$

H. $s = \frac{1}{3}$ or $s = 2$

11. Solve the following linear inequality $x-2 \geq 1$ AND $3x-1 < 3$ and express you answer in interval notation.

A. $x \in (-\infty, \frac{5}{2}) \cup (\frac{5}{6}, \infty)$

B. $x \in (3, \frac{4}{3}]$

C. $x \in (-\infty, \frac{13}{4}] \cup [\frac{19}{12}, \infty)$

D. The inequality has no solution x. Therefore, it is a contradiction.

E. $x \in (-\infty, \frac{5}{6}] \cap [\frac{5}{2}, \infty)$

F. $x \in (\frac{4}{3}, 3]$

G. $x \in (-\infty, \frac{19}{12}) \cap (\frac{13}{4}, \infty)$

H. $x \in [\frac{4}{3}, 3)$

12. Solve the following linear system by substitution. $\left\{ \begin{array}{l} 2x - 2y = -2 \\ -x + y = 1 \end{array} \right\}$

A. $(-4, 1)$.

B. $(3, 8)$.

C. There is no solution.

D. There are infinitely many solutions.

E. $(-3, 2)$.

F. $(-5, 0)$.

G. $(2, 7)$.

H. $(1, 6)$.

13. The water tank on a firetruck holds 1800 gal of water. This water is used so the firefighters can begin pumping water as soon as they arrive at a fire. The volume of water remaining in the tank x seconds after the pump has been turned on is displayed in the table.

x seconds	y gallons
0	1800
3	1728
6	1656
9	1584
12	1512

(a.) Determine the rate of change of the volume with respect to time. (b.) Interpret the meaning of this value. (c.) At this rate, how long do the firefighters have to connect to a hydrant before the water in the tank runs out? Caution: be careful with units.

A. (a.) The rate of change is -11 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 11 gallons. (c.) The firefighters have about 70 seconds before they must connect to a hydrant.

B. (a.) The rate of change is -24 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 24 gallons. (c.) The firefighters have about 75 minutes before they must connect to a hydrant.

C. (a.) The rate of change is -24 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 24 gallons. (c.) The firefighters have about 75 seconds before they must connect to a hydrant.

D. (a.) The rate of change is -18 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 18 gallons. (c.) The firefighters have about 81 seconds before they must connect to a hydrant.

E. (a.) The rate of change is -12 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 12 gallons. (c.) The firefighters have about 78 minutes before they must connect to a hydrant.

F. (a.) The rate of change is -11 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 11 gallons. (c.) The firefighters have about 70 minutes before they must connect to a hydrant.

G. (a.) The rate of change is -12 gallons/second. (b.) This means that for every second the hose is turned on, the volume of water in the tank will decrease by 12 gallons. (c.) The firefighters have about 78 seconds before they must connect to a hydrant.

H. (a.) The rate of change is -18 gallons/minute. (b.) This means that for every minute the hose is turned on, the volume of water in the tank will decrease by 18 gallons. (c.) The firefighters have about 81 minutes before they must connect to a hydrant.

14. Solve the following linear system by the addition method. $\left\{ \begin{array}{l} -\frac{x}{2} - \frac{y}{4} = 0 \\ \frac{x}{12} - \frac{y}{8} = \frac{1}{24} \end{array} \right\}$

A. There is no solution.

B. $(-\frac{7}{8}, -\frac{5}{4})$.

C. $(-\frac{15}{8}, -\frac{9}{4})$.

D. $(\frac{1}{8}, -\frac{1}{4})$.

E. $(\frac{25}{8}, \frac{11}{4})$.

F. $(\frac{33}{8}, \frac{15}{4})$.

G. $(-\frac{23}{8}, -\frac{13}{4})$.

H. There are infinitely many solutions.

15. Factor the expression by grouping. $35\alpha p + 42p + 20\alpha\beta + 24\beta$

A. $(5\alpha + 6)(7p + 4\beta)$

B. $(7p)(5\alpha + 6 + 4\beta)$

C. $(7p)(4\beta + 6 + 5\alpha)$

D. $(4\beta)(5\alpha + 6 + 7p)$

E. $(5\alpha)(4\beta + 6 + 7p)$

F. $(4\beta + 6)(5\alpha + 7p)$

G. $(5\alpha + 6)(7\beta + 4p)$

H. $(5p + 6)(7\alpha + 4\beta)$

16. Factor the polynomial. $64\gamma^2 - 9$

A. $(8\gamma + 3)(8\gamma + 3)$

B. $(3\gamma + 1)(2\gamma + 7)$

C. $(8\gamma - 3)(8\gamma - 3)$

D. $(64\gamma - 3)(8\gamma - 9)$

E. $(8\gamma + 3)(8\gamma - 3)$

F. $(64\gamma + 3)(8\gamma + 9)$

G. $(64\gamma + 3)(8\gamma - 9)$

H. Not factorable.

17. Solve the following linear inequality $-2x + 4 \geq -5x + 2$.

A. $\frac{8}{3} \leq x$

B. $-\frac{1}{6} \leq x$

C. $x \geq \frac{1}{3}$

D. $x \geq -\frac{2}{3}$

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

F. $-\frac{1}{3} \leq x$

G. $x \geq \frac{1}{6}$

H. $x \geq -\frac{8}{3}$

18. Solve the following linear inequality $3(-x-3) > (-5)$.

A. $x < \frac{4}{3}$

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

C. $x < -\frac{8}{3}$

D. $x < -4$

E. $x < -\frac{16}{3}$

F. $x < \frac{8}{3}$

G. $x < -\frac{1}{3}$

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

19. Simplify the expression. $\left(\frac{\alpha^{-5}x^{-8}}{\alpha^{6}x^{-2}}\right)^{-6}$

A. $\alpha^{17}x^{-31}$

B. $\alpha^{-7}x^{-16}$

C. $\alpha^{-38}x^{-45}$

D. $\alpha^{-17}x^{-12}$

E. $\alpha^{66}x^{36}$

F. $\alpha^{15}x^{9}$

G. x^{-12}

H. $\alpha^{6}x^{60}$

20. Simplify the expression. $\left(\frac{\gamma^5}{\gamma^2}\right)^7$

A. γ^{21}

B. γ^{14}

C. γ^{18}

D. γ^{10}

E. γ^{-57}

F. γ^{49}

G. γ^{63}

H. 10γ

Answers

1. A.
2. A.
3. H.
4. B.
5. G.
6. C.
7. F.
8. G.
9. G.
10. C.
11. D.
12. D.
13. C.
14. D.
15. A.
16. E.
17. D.
18. B.
19. E.
20. A.