

Show all necessary steps clearly, neatly, systematically to receive full credit. Any incorrect statement will be penalized.

1. (2) Write 0.000000567 as scientific notation.

$$= 5.67 \times 10^{-7}$$

2. (2) Write 7.07×10^9 as standard notation.

$$= 7,070,000,000$$

3. (2) Divide: $\frac{-30a^4b^4 - 15a^3b - 10a^2b^2}{-10a^2b^3}$.

$$= \frac{-30a^4b^4}{-10a^2b^3} - \frac{15a^3b}{-10a^2b^3} - \frac{10a^2b^2}{-10a^2b^3}$$

$$= 3a^2b + \frac{2b^2}{3a} + \frac{1}{b}$$

4. (2) Multiply: $-3x^3y(x^2 + y^2 + xy - 1)$.

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

9. (2) Multiply: $2t(t+8)(t+10)$.

$$= 2t(t^2 + 10t + 8t + 80)$$

$$= 2t(t^2 + 18t + 80)$$

$$= 2t^3 + 36t^2 + 160t$$

10. (2) Multiply: $(3x+1)(2x^2-3x+1)$.

$$= 6x^3 - 9x^2 + 3x + 2x^2 - 3x + 1$$

$$= 6x^3 - 7x^2 + 1$$

6. (2) Multiply: $\left(4h + \frac{3}{2}\right)\left(4h - \frac{3}{2}\right)$.

$$= (4h)^2 - \left(\frac{3}{2}\right)^2$$

$$= 16h^2 - \frac{9}{4}$$

7. (2) Multiply: $(2x+5y)^2$.

$$= (2x)^2 + 2(2x)(5y) + (5y)^2$$

$$= 4x^2 + 20xy + 25y^2$$

8. (2) Multiply: $\left(q^5 - \frac{1}{2}\right)\left(q^5 - \frac{3}{3}\right)$.

$$= (q^5)^2 - 2\left(q^5\right)\left(\frac{3}{3}\right) + \left(\frac{3}{3}\right)^2$$

$$= q^{10} - \frac{3}{2}q^5 + \frac{9}{1}$$

$$\begin{aligned}
 &= -4z^3 + 5z^2 + 5z - 17 \\
 &= -4z^3 + 2z^2 + z - 10 + 3z^2 + 4z - 7 \\
 &= [2z^2 + 3z - 7 - 4z^3 - 2z - 3] - (-3z^2 - 4z + 7) \\
 &= [2z^2 + 3z - 7 + (-4z^3 - 2z - 3)] - (-3z^2 - 4z + 7)
 \end{aligned}$$

13. (5) Subtract $-3z^2 - 4z + 7$ from the sum of $2z^2 + 3z - 7$ and $-4z^3 - 2z - 3$.

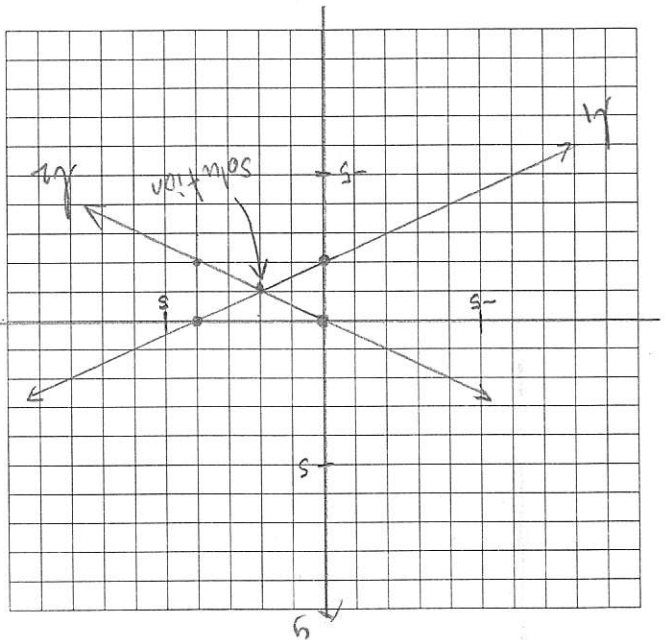
$$\begin{aligned}
 &= \frac{8r^6s^5}{1} \\
 &= \frac{r^{-6}s^{14} \cdot 8r^{12}s^{-9}}{1} \\
 &= \frac{(r^{-3}s^7)^2 \cdot (2r^4s^{-3})^3}{1} \\
 &= \frac{(r^{-3}s^7)^2 (2r^4s^{-3})^3}{(2r^4s^{-3})^3 (r^{-3}s^7)^2}
 \end{aligned}$$

12. (5) Simplify:

$$\begin{aligned}
 &= \frac{9a^{22}b^{16}}{1} \\
 &= \frac{9a^{22}b^{-16}}{1} \\
 &= \frac{1}{9} \cdot 81 \cdot a^{8+14} b^{-6+(-10)} \\
 &= \frac{1}{9} \cdot a^8 b^{-6} \cdot 81 a^{14} b^{-10} \\
 &= (3)^{-2} (a^{-4})^{-2} (b^3)^{-2} (9)^2 (a^7)^2 (b^{-5})^2 \\
 &= (3a^{-4}b^3)^{-2} (9a^7b^{-5})^2
 \end{aligned}$$

11. (5) Simplify: $(3a^{-4}b^3)^{-2} (9a^7b^{-5})^2$

14. (5) Solve by graphing method: $\begin{cases} 3x - 6y = 12 & -L_1 \\ x = -2 & -L_2 \end{cases}$



L₁ $3x - 6y = 12$

$3x - 12 = 6y$

$\frac{6}{3}x - \frac{6}{12} = y$

$\frac{1}{2}x - 2 = y$

$(-2, -1)$

L₂ $x = -2$

$-\frac{1}{2}x = y$

15. (5) Solve by substitution method:

$\begin{cases} 6x + y = -8 + 3x - y \\ 3x + y = 2y + x - 3 \end{cases}$

$\begin{cases} 3x + 2y = -8 \\ 2x - y = -3 \end{cases}$

$2x - y = -3$
 $-y = -2x - 3$

$y = 2x + 3$

$3x + 2y = -8$

$3x + 2(2x + 3) = -8$

$3x + 4x + 6 = -8$

$7x + 6 = -8$

$7x = -14$

$x = -2$

$y = 2(-2) + 3$

$y = 2x + 3$

$= -1$

$(-2, -1)$

$$\parallel (1, 7)$$

$$\begin{aligned} d &= 7 \\ 7(1) + d &= 14 \\ 7c + d &= 14 \end{aligned}$$

$$c = 1$$

$$\begin{array}{r} 37c \\ = 37 \end{array}$$

$$+ \begin{cases} 35c + 5d = 70 \\ 2c - 5d = -33 \end{cases}$$

$$5 \cdot \begin{cases} 7c + d = 14 \\ 2c - 5d = -33 \end{cases}$$

16. (s) Solve by Addition method:

$$14 \cdot \begin{cases} \frac{c}{2} + \frac{d}{14} = 1 \\ \frac{c}{5} - \frac{d}{2} = -\frac{10}{33} \end{cases}$$

many solutions

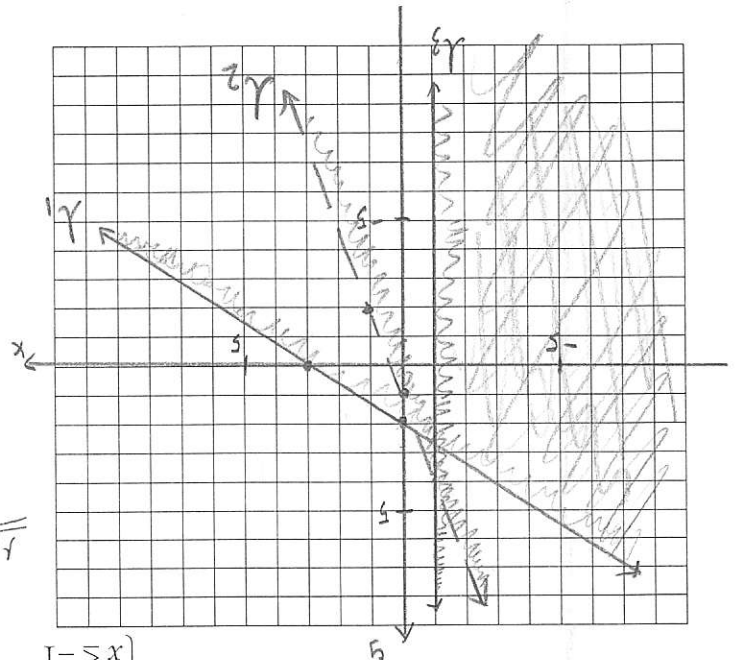
$$0 = 0 \rightarrow \text{true}$$

$$+ \begin{cases} -12x + 24y = -108 \\ 12x - 24y = 108 \end{cases}$$

$$-3 \cdot \begin{cases} 4x - 8y = 36 \\ 4 \cdot \begin{cases} 3x - 6y = 27 \end{cases} \end{cases}$$

17. (s) Solve: $\begin{cases} 4x = 8y + 36 \\ 3x - 6y = 27 \end{cases}$

18. (c) Graph the solution of the system:

$$\begin{cases} 2x+3y \leq 6 & -l_1 \\ 3x+y < 1 & -l_2 \\ x \leq -1 & -l_3 \end{cases}$$


l₁

$$2x + 3y \leq 6$$

$$3y \leq -2x + 6$$

$$y \leq -\frac{2}{3}x + 2$$

$$y \leq -\frac{2}{3}x + \frac{3}{6}$$

$$y \leq -\frac{2}{3}x + 2$$

Test (0,0)

$$2(0) + 3(0) \leq 6$$

$$0 \leq 6 \rightarrow \text{True}$$

l₂

$$3x + y < 1$$

$$y < -3x + 1$$

Test (0,0)

$$3(0) + (0) < 1$$

$$0 < 1 \rightarrow \text{True}$$