

All work for this packet must be completed on notebook paper and stapled to this document.

Section 1: Solve the following Equations.

1. $2(x+9) = 20$

2. $3(x-4) = 24$

3. $24 = 4(y-9)$

4. $\frac{1}{2}(x+6) = 3$

5. $x+16 = 2x+9$

6. $4y-7 = 2y+7$

7. $5x+9 = x-5$

8. $6-2x = 5x+9$

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

10. $4(\frac{1}{2}y-3) = 2(y-4)$

11. $5(x+3)-8 = 2(x-7)+9$

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

13. $2(m-11) = 4(m+1)-7m$

14. $\frac{1}{3}(x-2) = \frac{1}{6}(x-3)$

15. $\frac{4}{x} = \frac{3}{7}$

Section 2: Solve the inequalities

1. $x+2 < 2x+8$

2. $2y-9 > y+4$

3. $6x+8 \leq x+7$

4. $6-2x \geq 2x+10$

5. $-4(x+3) \geq -20$

6. $-4(3-x) > 12$

7. $9-\frac{3}{5}x < 1$

8. $2(x-10) \leq 3(x-4)$

Section 3: Write the following as algebraic equations – do not solve

1. Eight more than a number is 12.

2. Nine more than twice the cubed root of a number.

3. Twice the sum of a number and 7 is increased by 5. The result is 25.

4. Half a number, increased by 11 is twice the same number decreased by 5.

5. Three times the difference of a number and 5 is twice the sum of the same number and 4.

Section 4: Literal equations – Solve the equation for the indicated variable.

1. $P = IRT$ (R)

2. $A = 2(L+W)$ (L)

3. $P = \frac{R-C}{N}$ (R)

4. $y = mx + b$ (b)

5. $ax + by = c$ (x)

6. $A = \frac{1}{2}h(b_1 + b_2)$ (b_2)

7. $2x - 3y = 6$ (y)

8. $-2(x+7y) = 4$ (y)

9. $a^2 + b^2 = c^2$ (a^2)

10. $P = 2a + 3b - 4c$ (a)

Section 5: Solve each equation for y. Put your answer in slope-intercept form. Identify the slope and y-intercept.

1. $4x + 3y = -12$

2. $2x + 8y = 12$

3. $2x - 6y = 10$

4. $-2x + 5y = 15$

5. $\frac{2}{3}x + y = 1$

6. $2x = -3y - 6$

7. $\frac{3}{4}x + \frac{1}{8}y = 6$

8. $4x + 6y = 12$

9. $-2x - 5y = 20$

Section 6: Factor each expression completely.

1. $x^2 - 16x + 64$

2. $3x^2 + 22x + 7$

3. $24x^2 + 2x - 1$

4. $32x^3y - 98xy^3$

5. $15x^2y + 20xy^2$

6. $x^2 + 7x + 6$

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

8. $4x^2 - 9y^2$

9. $12x^{12}p^3 + 36x^5p^3 - 4x^4p^2 - 6x^3p^2$

10. $2p^2 - 98$

11. $b^2 - 25a^2$

12. $8x^2 + 6x - 27$

13. $x^2 - 12x + 36$

14. $6x^2 - 37x - 35$

15. $x^2 + 9x - 22$

Section 7: Solve By Factoring

1. $x^2 - 81 = 0$

2. $x^2 - 8x + 7 = 0$

3. $12x^2 - x - 6 = 0$

4. $2x^2 - 6x = 0$

5. $x^2 + 6x - 27 = 0$

6. $x^3 + 5x^2 - 14x = 0$

7. $x^2 = 25$

8. $6x^2 = 5x + 6$

9. $3x^2 - 13x + 10 = 0$

Section 8: Perform the indicated operations to simplify the polynomials.

1. $(x+10)(x+5)$

2. $(5a+2b)(3a-b)$

3. $(2x+4)(3x^2+6x-3)$

4. $(a+2b)^2$

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

6. $(2x-5y)(x+4y)$

7. $(x^2-2x+4)+(3x^2-6x+11)$

8. $(x^2-6x+4)-(5x^2-2x+7)$

9. $3(p+2q+9r)+2(3p-2q+5r)$

10. $2(x^2-3x+4)-(x^2+2x+10)$

Section 9: Simplify the monomials using your rules of exponents.

1. $\frac{a^5c^4b^5}{a^2c^2b^7}$

2. $\frac{15x^{12}y^{14}z^3}{3x^3y^4z^6}$

3. $(6b^3c^2a^4)(2a^{11}b^2c^5)$

4. $(2x^{13}y^{12}z^{10})^4$

5. $(5x^3y^5z^6)(7x^9yz^5)$

6. $(4x^2y^7z^4)^2$

$$7. \frac{(3x^2y^2)^3}{x^3y^5}$$

$$8. \left(\frac{2x^{-15}y^{12}z^{-62}}{16x^{40}y^{-67}z^{82}} \right)^0$$

$$9. 2x^4y^3z(x^6y^3z^4)^5$$

$$10. \frac{a^{-3}c^9b^9}{a^2c^{-4}b^7}$$

$$11. (3x^{-3}y^{12}z^{-7})^{-2}$$

$$12. (2x^{10})^0 + 5x^0$$

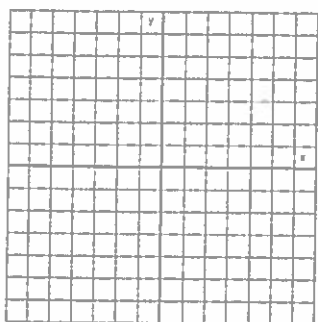
$$13. x^{100} \cdot x^{200}$$

$$14. \frac{8a^2c^4b^5}{-16a^{16}b^2c^5}$$

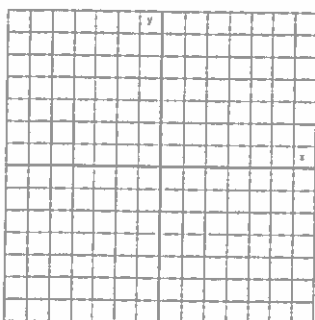
$$15. (6b^3c^2a^4)(2a^{11}b^2c^5)$$

Section 10: Find the solutions to the systems of equations by graphing.

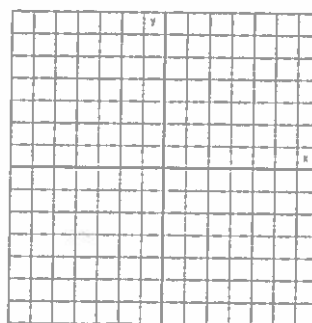
$$1. \begin{cases} x + y = 6 \\ y = 2x - 3 \end{cases}$$



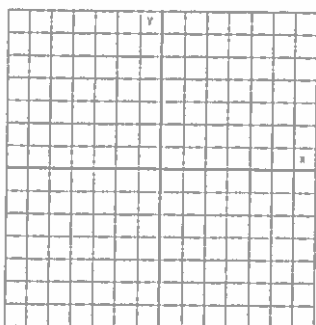
$$2. \begin{cases} x - y = -2 \\ y = 2x - 1 \end{cases}$$



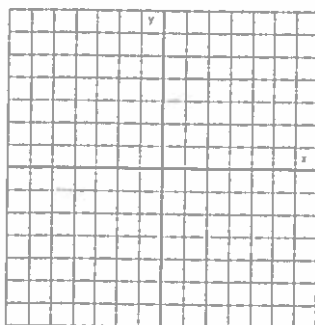
$$3. \begin{cases} 4y - x = 4 \\ y = -\frac{1}{4}x + 1 \end{cases}$$



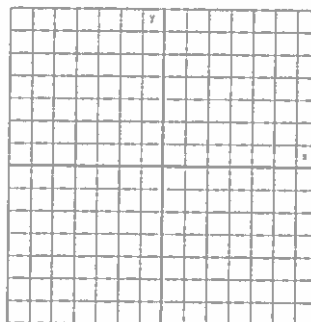
$$4. \begin{cases} y = -3x + 1 \\ y - 2x = -4 \end{cases}$$



$$5. \begin{cases} 2y = -2x + 8 \\ y = -x \end{cases}$$



$$6. \begin{cases} y = -\frac{2}{3}x + 1 \\ y = \frac{4}{3}x - 5 \end{cases}$$



Section 11: Find the solutions to the systems of equations by Substitution or Elimination.

1. $2x + y = 10$
 $2x = 4y$

2. $y = 3x - 26$
 $3x + y = 10$

3. $x - y = 5$
 $x + y = 7$

4. $7x - 10y = 4$
 $x + 5y = 7$

5. $x - 3y = 5$
 $-2x + 6y = 11$

6. $4x - y = 5$
 $3x + y = 9$

7. $4x + 2y = 2$
 $3x - y = 4$

8. $2x + 6y = 26$
 $x + 4y = 20$

Section 12: Use the following formula to answer the questions $z = \frac{x - \mu}{\sigma}$.

1. Find z if $x = 28$, $\sigma = 4$, and $\mu = 32$.

2. Find z if $x = 550$, $\sigma = 60$, and $\mu = 600$.

3. Find x if $z = 1$, $\sigma = 9$, and $\mu = 110$.

4. Find x if $z = -2.3$, $\sigma = 15$, and $\mu = 305$.

5. Find μ if $x = 78$, $\sigma = 13$, and $z = -.25$.

6. Find μ if $x = 2640$, $\sigma = 250$, and $z = 1.8$.

7. Find σ if $x = 95$, $z = .9$, and $\mu = 88$.

8. Find σ if $x = 190$, $z = -.5$, and $\mu = 215$.

9. If the average test score is an 80 with standard deviation 12, what would a person's raw score be if his z -score is a 1.6?

10. If the average test score is a 430 with standard deviation 42, what would a person's raw score be if his z -score is a .75?

Section 13: Simplify the radical expressions.

1. $\sqrt{48x^6y^3}$

2. $\sqrt{x^3a^5b}$

3. $\sqrt[3]{375x^6y^7}$

4. $\sqrt{100x^7y^2}$

5. $\sqrt[3]{16b^6d^{12}}$

6. $\sqrt{288x^4y^5z^2}$

7. $\sqrt{512}$

8. $\sqrt{600}$

9. $5\sqrt{72}$

10. $\sqrt[3]{250a^9b^3}$

11. $5\sqrt{160x^7y^5}$

12. $\sqrt[3]{128c^4b^{12}}$

13. $-3\sqrt{2} + 3\sqrt{20} - 3\sqrt{8}$

14. $-3\sqrt{7} + 4\sqrt{7}$

15. $-3\sqrt{45} + 2\sqrt{12} + 3\sqrt{6} - 3\sqrt{20}$

Section 14: Evaluate the functional values if:

$$f(x) = x^2 - 5$$

$$g(x) = 5x^2 - 3x + 1$$

$$h(x) = 4x - 1$$

1. $h(-2) =$

2. $g(-3) =$

3. $f(10) =$

4. $f(-3) =$

5. $h\left(\frac{1}{2}\right) =$

6. $f(h(2)) =$

7. $g(h(1)) =$

8. $f(-5) =$

9. $h(35) =$

10. $g(-4) =$

11. $f(h(4)) =$

12. $h(f(11)) =$

Section 15: Linear equations.

1. What is the equation of the line through the points (2,1) and (-2,-7)?
2. What is the equation of the line if $y = -3x - 2$ is shifted up 6 units?
3. What is the equation of the line with slope $1/3$ and passes through (6,2)?
4. What is the equation of the line that passes through (1,2) and (2,6)?
5. What is the equation of the line that is parallel to $y = \frac{1}{3}x + 1$ and passes through (6,5)?
6. Find the slope of the line that passes through (-1,2) and (-11, 5).
7. What is the slope of a horizontal line?
8. What is the slope of a vertical line?
9. What is the equation of the line perpendicular to $y = \frac{-3}{4}x + 1$ and passes through the point (6,3)?
10. What is the equation of the line with slope $1/3$ and y - intercept 6?

Section 16: Simplify the rational expressions.

1. $\frac{x^2 - 144}{x - 12}$
2. $\frac{y^3 + y - 2}{y - 1}$
3. $\frac{2x^2 - 7x - 15}{2x + 3}$
4. $\frac{12x^4y - 6x^3y^6}{2xy}$
5. $\frac{4y - 1}{12y^2 - 23y + 5}$
6. $\frac{x + 5}{x^2 - 25}$
7. $\frac{x - 3}{x^2 - x - 6}$
8. $\frac{-4x^3y^4 + 2x^2y^7 + 22x^4y^8}{2x^2y^4}$
9. $\frac{24a^4 + 28a^9 + 36a^8}{4a^2}$

Section 17: Direct and inverse variation.

1. Find the constant of variation if y varies directly as x and $y = 6$ when $x = 14$.
2. Find x when $y = 9$, if y varies directly as x and $x = 15$ when $y = 5$.
3. Find y when $x = 11$, if y varies inversely as x and $x = 9$ when $y = 13$.
4. Find y when $x = 8$, if y varies directly as x and $x = 10$ when $y = 7$.
5. Find y when $x = 13$, if x varies directly as y and $y = 11$, when $x = 6$.