



Summer Review Packet For PreCal and PreCal Topics

This packet is a review of topics that were covered in either Algebra I or Algebra II/Trig and are necessary for success in all levels of PreCal.

ALL work should be completed and be ready to turned in on the first day of school, August 19.

This packet will count as two homework grades and there will be a test on the material during the first week of school.

I will be available at school on Tuesday, July 7, and Thursday, July 16 9:00 - 11:00 a. m. to help you with the packet and answer any questions you may have.

ENJOY YOUR SUMMER!!

I LOOK FORWARD TO SEEING YOU IN AUGUST
READY TO BEGIN A FUN AND CHALLENGING YEAR IN PRECAL!

NAME: _____



FORMULA SHEET

QUADRATIC EQUATION

$$ax^2 + bx + c = 0$$

QUADRATIC FORMULA

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

MIDPOINT

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

DISTANCE

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

SLOPE

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

LINEAR EQUATIONS

Slope-intercept form: $y = mx + b$

Point-slope form: $(y - y_1) = m(x - x_1)$

Standard form: $Ax + By = C$

PROPERTIES OF EXPONENTS

$$b^m \cdot b^n = b^{m+n}$$

$$(b^m)^n = b^{m \cdot n}$$

$$(ab)^m = a^m b^m$$

$$\frac{b^m}{b^n} = b^{m-n}$$

$$\left(\frac{a}{b} \right)^m = \frac{a^m}{b^m}$$

$$b^{-n} = \frac{1}{b^n}$$

OPERATIONS ON POLYNOMIALS

Perform the indicated operations.

1. $(5x^2 - 7x - 8) + (2x^2 - 3x + 7) - (x^2 - 4x - 3)$	2. $-2xy^2(5x^2 - 3xy + 2y^2)$
3. $(2x + 3)^2$	4. $(2x - 3)(5x + 3)$
5. $(5x^2 - 4)(3x^2 - 7)$	6. $(3x + 2)(3x - 2)$
7. $(4x^2 - 1)^2$	8. $(x - 1)(x^2 - x + 1)$
9. $(x - 3y)(2x + 7y)$	10. $(3x - 4)^3$

11. $(x^2y^2 - 3)^2$

12. $(x + y + 3)(x + y - 3)$

13. $(x + y + 1)^2$

14. $(5x - 7)(3x - 2) - (4x - 5)(6x - 1)$

15. $(3x + 4y)^2 - (3x - 4y)^2$

16. $(2x + 5)(2x - 5)(4x^2 + 25)$

FACTORING

Factor or state that the polynomial is prime.

1. $18x + 27$	2. $9x^4 - 18x^3 + 27x^2$
3. $x^2 - 2x - 15$	4. $x^2 - 8x + 15$
5. $3x^2 - x - 2$	6. $3x^2 - 25x + 28$
7. $6x^2 - 11x + 4$	8. $20x^2 + 27x - 8$
9. $6x^2 - 5xy - 6y^2$	10. $36x^2 - 49$
11. $9x^2 - 25y^2$	12. $x^4 - 16$
13. $x^2 - 14x + 49$	14. $x^3 - 2x^2 + 5x - 10$

15. $3x^3 - 2x^2 - 6x + 4$

16. $x^3 - 64$

17. $x^3 + 27$

18. $64x^3 + 27$

19. $x^2 + 64$

20. $4x^2 - 4x - 24$

21. $2x^4 - 162$

22. $x^3 + 2x^2 - 9x - 18$

23. $x^2y - 16y + 32 - 2x^2$

24. $y^5 - 81y$

SOLVING EQUATIONS AND INEQUALITIES

1. $\frac{x+3}{6} = \frac{3}{8} + \frac{x-5}{4}$

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

3. $\frac{1}{5}(3x-5) = -\left(\frac{x}{2} + 10\right)$

4. $\frac{-2x}{3} > 8$

5. $3(x+1) - 4 > 2(2x+1) - 1$

6. $|2x-1| = 5$

7. $2|3x-2| = 14$

8. $2|x+1| - 5 = 3$

9. $|2x-1| + 3 = 3$

10. $|2x-5| + 8 = 7$

11. $|6x - 3| < 21$

12. $|7x| + 4 < 0$

13. $|3x - 12| \geq 6$

14. $2|x + 5| - 9 > 15$

Solve by Factoring.

15. $x^2 - 3x - 10 = 0$

16. $x^2 = 8x - 15$

17. $5x^2 = 20x$

18. $3x^2 = 27$

19. $6x^2 = 5x + 4$

20. $10x^2 - 11x = 6$

Solve by using the Quadratic Formula.

21. $x^2 + 5x + 3 = 0$

22. $3x^2 - 3x - 4 = 0$

23. $4x^2 = 3x + 7$

24. $x^2 - 6x + 11 = 0$

Solve by any appropriate method.

25. $5x^2 + 2 = 11x$

26. $(2x + 3)(x + 4) = 1$

$$27. (3x - 4)^2 = 16$$

$$28. 3x^2 - 12x + 12 = 0$$

$$29. x^2 = 4x - 2$$

$$30. 2x^2 - 7x = 0$$

$$31. 7 - 7x = (3x + 2)(x - 1)$$

RADICALS

Simplify.

1. $\sqrt{36}$	2. $\sqrt{-36}$	3. $-\sqrt{36}$
4. $\sqrt{50}$	5. $\sqrt{45x^2}$	6. $\sqrt{2x} \cdot \sqrt{6x}$
7. $\sqrt{x^3}$	8. $\sqrt{3x^2} \cdot \sqrt{6x}$	9. $\sqrt{\frac{1}{81}}$
10. $\frac{\sqrt{48x^3}}{\sqrt{3x}}$	11. $\frac{\sqrt{150x^4}}{\sqrt{3x}}$	12. $7\sqrt{3} + 6\sqrt{3}$
13. $6\sqrt{17x} - 8\sqrt{17x}$	14. $\sqrt{8} + 3\sqrt{2}$	15. $\sqrt{50x} - \sqrt{8x}$
16. $3\sqrt{18} + 5\sqrt{50}$	17. $3\sqrt{8} - \sqrt{32} + 3\sqrt{72} - \sqrt{75}$	18. $\frac{\sqrt{2}}{\sqrt{5}}$
19. $\frac{13}{3 + \sqrt{11}}$	20. $\frac{7}{\sqrt{5} - 2}$	21. $\frac{6}{\sqrt{5} + \sqrt{3}}$
22. $\sqrt[3]{125}$	23. $\sqrt[3]{-8}$	24. $\sqrt[5]{-\frac{1}{32}}$

25. $\sqrt[3]{32}$	26. $\sqrt[3]{x^4}$	27. $\sqrt[3]{9} \cdot \sqrt[3]{6}$
28. $\frac{\sqrt[5]{64x^6}}{\sqrt[5]{2x}}$	29. $4\sqrt[5]{2} + 3\sqrt[5]{2}$	30. $\sqrt{2} + \sqrt[3]{8}$

Solve. Remember to check your answers.

31. $\sqrt{3x+18} = x$	32. $\sqrt{x+3} = x-3$
33. $\sqrt{2x+13} = x+7$	34. $x - \sqrt{2x+5} = 5$

EXPONENTS

Simplify.

1. $(-9x^3y)(2x^6y^4)$	2. $\frac{25a^{13}b^4}{-5a^2b^7}$
3. $(4x^3y^2z^5)^{-2}$	4. $\left(\frac{5x^3}{y}\right)^{-2}$
5. $\left(\frac{3a^{-5}b^2}{12a^3b^{-4}}\right)^0$	6. $\frac{10x^4y^9}{30x^{12}y^{-2}}$
7. $\left(\frac{-30a^{14}b^8}{10a^{17}b^{-2}}\right)^3$	8. $\left(\frac{8m^{-3}n^2p^{-4}}{10m^{-5}n^{-3}p}\right)^{-2}$
9. $\frac{s^{\frac{7}{12}}t^{\frac{5}{6}}}{s^{\frac{1}{3}}t^{\frac{1}{6}}}$	10. $\frac{x^{\frac{8}{15}}y^{\frac{4}{5}}}{x^{\frac{1}{3}}y^{\frac{1}{5}}}$

RATIONAL EXPRESSIONS

Simplify.

$$1. \frac{x^2 - 5x + 6}{x^2 - 2x - 3} \square \frac{x^2 - 1}{x^2 - 4}$$

$$2. \frac{4x^2 + 10}{x - 3} \div \frac{6x^2 + 15}{x^2 - 9}$$

$$3. \frac{x^2 + x - 12}{x^2 + x - 30} \cdot \frac{x^2 + 5x + 6}{x^2 - 2x - 3} \div \frac{x + 3}{x^2 + 7x + 6}$$

$$4. \frac{3}{2x + 4} + \frac{2}{3x + 6}$$

$$5. \frac{3x}{x^2 + 3x - 10} - \frac{2x}{x^2 + x - 6}$$

$$6. \frac{x + 3}{x^2 - 1} - \frac{x + 2}{x - 1}$$

$$7. \frac{4x^2 + x - 6}{x^2 + 3x + 2} - \frac{3x}{x + 1} + \frac{5}{x + 2}$$

$$8. \frac{\frac{x}{3} - 1}{x - 3}$$

$$9. \frac{x - \frac{x}{x+3}}{x+2}$$

$$10. \frac{\frac{3}{x-2} - \frac{4}{x+2}}{\frac{7}{x^2-4}}$$

Solve. Remember to check your answers.

$$11. \frac{4}{x} = \frac{5}{2x} + 3$$

$$12. \frac{1}{x-1} + 5 = \frac{11}{x-1}$$

$$13. \frac{4x}{x+3} - \frac{2}{x-3} = \frac{4x^2+36}{x^2-9}$$

$$14. \frac{x-4}{x-2} = \frac{1}{x-4}$$

$$15. \frac{x+2}{x-2} + \frac{x-2}{x+2} = \frac{8-4x}{x^2-4}$$

$$16. \frac{x+7}{x^2-x-6} = \frac{2}{x-3} - \frac{1}{x+2}$$

LINEAR EQUATIONS

Find the slope and midpoint for each pair of points.

1. (4,7) (8,10)	2. (4,-2) (3,-2)	3. (5,3) (5,-2)
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Find the equation of the line in slope-intercept form. ($y = mx + b$)

4. slope = 2 and passing through (3,5)	5. slope = $\frac{1}{2}$ and passing through the origin
6. slope = $-\frac{2}{3}$ and passing through (6,-2)	7. Passing through the points (-3,-2) and (3,6)
8. Passing through the point (2, 4) with x - intercept = -2	9. With x - intercept = $-\frac{1}{2}$ and y - intercept = 4.

10. Passing through $(-8, -10)$ and parallel to the line
 $4x + y = 3$

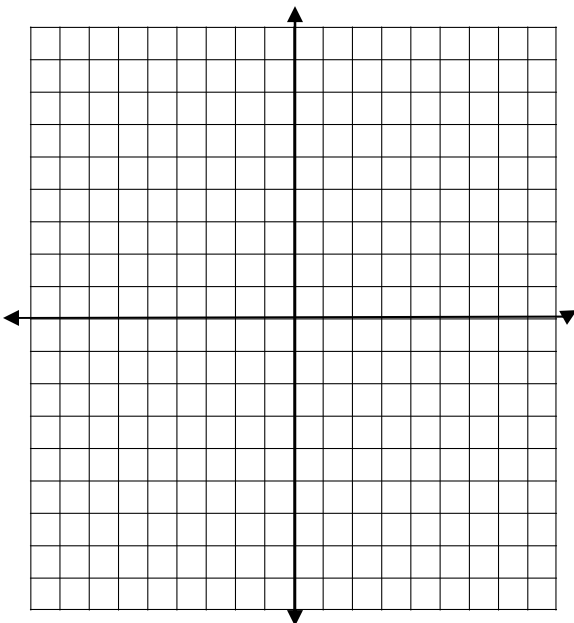
11. Passing through $(2, -3)$ and perpendicular to
the line $y = \frac{1}{5}x + 6$

12. Passing through $(-1, 5)$ and parallel to the line
 $2y - 4 = 8$

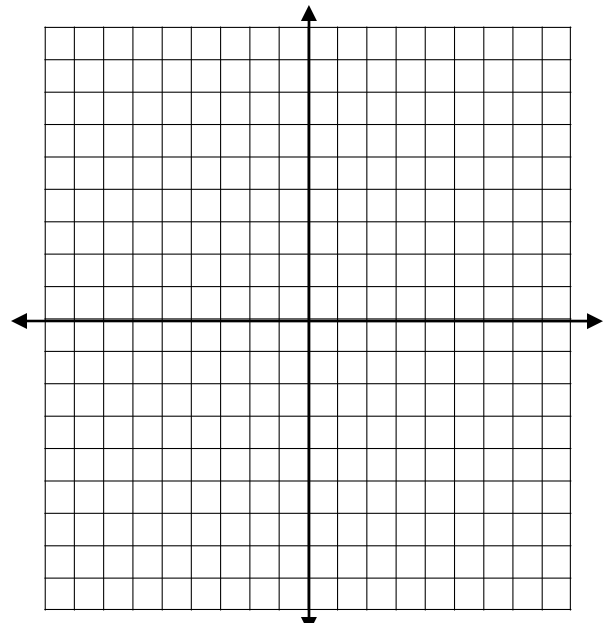
13. Passing through $(-6, 4)$ and perpendicular to the
line $2x = 6$.

Graph each of the following equations or inequalities.

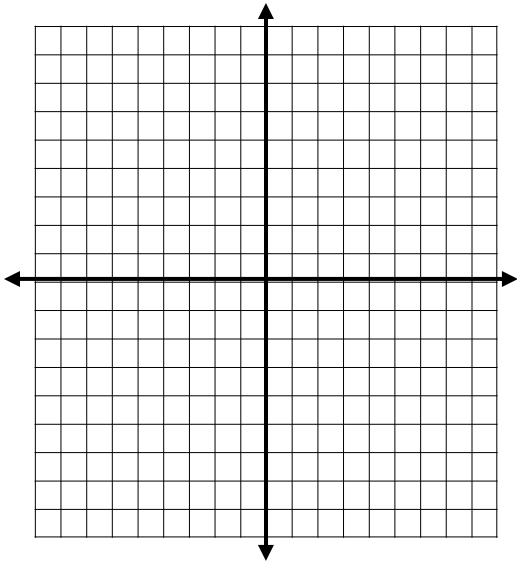
14. $3x + y - 5 = 0$



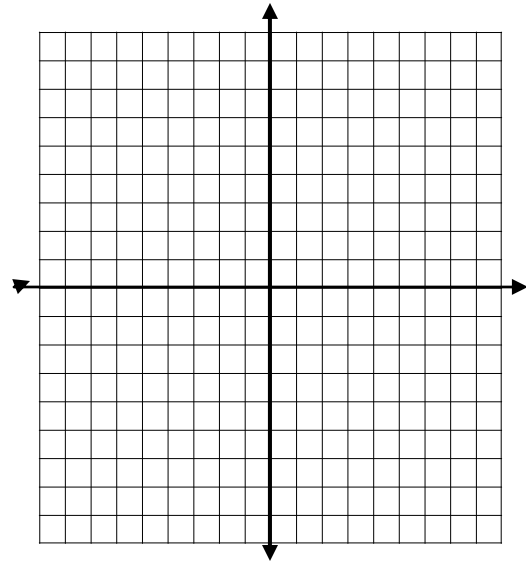
15. $2x + 3y - 18 = 0$



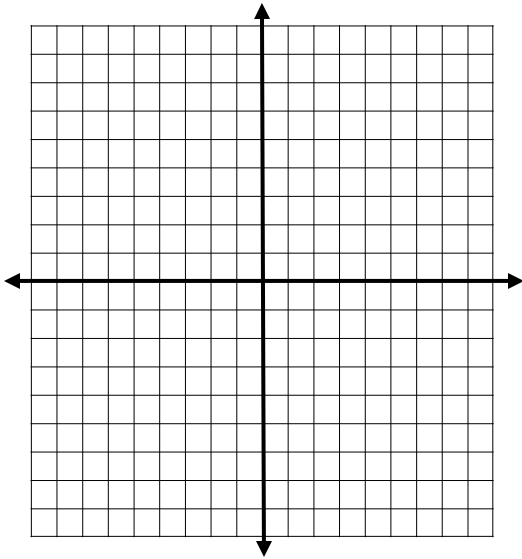
16. $3y - 9 = 0$



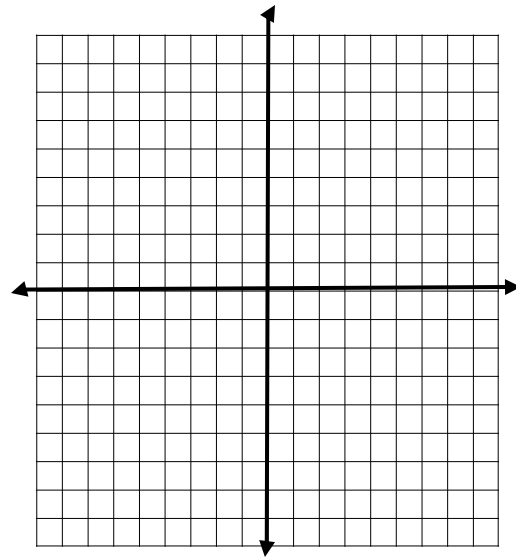
17. $x + 2y = 0$



18. $3x + y < 4$



19. $5x - 2y \leq -6$



Solve each system.

20. $5x + 4y = 2$
 $2x - 3y = -13$

21. $2x - y = -1$
 $y + x = 4$

ANSWER KEY

<u>OPERATIONS ON POLYNOMIALS</u>	<u>FACTORING</u>	<u>SOLVING EQUATIONS AND INEQUALITIES</u>
1. $6x^2 - 6x - 2$ 2. $-10x^3y^2 + 6x^2y^3 - 4xy^4$ 3. $4x^2 + 12x + 9$ 4. $10x^2 - 9x - 9$ 5. $15x^4 - 47x^2 + 28$ 6. $9x^2 - 4$ 7. $16x^4 - 8x^2 + 1$ 8. $x^3 - 2x^2 + 2x - 1$ 9. $2x^2 + xy - 21y^2$ 10. $27x^3 - 108x^2 + 144x - 64$ 11. $x^4y^4 - 6x^2y^2 + 9$ 12. $x^2 + 2xy + y^2 - 9$ 13. $x^2 + 2xy + y^2 + 2x + 2y + 1$ 14. $-9x^2 + 3x + 9$ 15. $48xy$ 16. $16x^4 - 625$	1. $9(2x+3)$ 2. $9x^2(x^2 - 2x + 3)$ 3. $(x-5)(x+3)$ 4. $(x-3)(x-5)$ 5. $(3x+2)(x-1)$ 6. $(3x-4)(x-7)$ 7. $(3x-4)(2x-1)$ 8. $(5x+8)(4x-1)$ 9. $(3x+2y)(2x-3y)$ 10. $(6x+7)(6x-7)$ 11. $(3x+5y)(3x-5y)$ 12. $(x^2+4)(x+2)(x-2)$ 13. $(x-7)^2$ 14. $(x^2+5)(x-2)$ 15. $(x^2-2)(3x-2)$ 16. $(x-4)(x^2+4x+16)$ 17. $(x+3)(x^2-3x+9)$ 18. $(4x+3)(16x^2-12x+9)$ 19. Prime 20. $4(x-3)(x+2)$ 21. $2(x^2+9)(x+3)(x-3)$ 22. $(x+2)(x+3)(x-3)$ 23. $(y-2)(x+4)(x-4)$ 24. $y(y^2+9)(y+3)(y-3)$	1. $\frac{33}{2}$ or 16.5 2. -12 3. $-\frac{90}{11}$ 4. $x < -12$ 5. $x < -2$ 6. -2, 3 7. 3, $-\frac{5}{3}$ 8. -5, 3 9. $\frac{1}{2}$ 10. No solution 11. $-3 < x < 4$ 12. No solution 13. $x \geq 6$ or $x \leq 2$ 14. $x > 7$ or $x < -17$ 15. -2, 5 16. 3, 5 17. 0, 4 18. -3, 3 19. $\frac{4}{3}, -\frac{1}{2}$ 20. $-\frac{2}{5}, \frac{3}{2}$ 21. $\frac{-5 \pm \sqrt{13}}{2}$ 22. $\frac{3 \pm \sqrt{57}}{6}$ 23. -1, $\frac{7}{4}$ 24. $3 \pm i\sqrt{2}$ 25. 2, $\frac{1}{5}$ 26. $\frac{-11 \pm \sqrt{33}}{4}$ 27. 0, $\frac{8}{3}$ 28. 2 29. $2 \pm \sqrt{2}$ 30. 0, $\frac{7}{2}$ 31. -3, 1

RADICALS

1. 6
2. $6i$
3. -6
4. $5\sqrt{2}$
5. $3x\sqrt{5}$
6. $2x\sqrt{3}$
7. $x\sqrt{x}$
8. $3x\sqrt{2x}$
9. $\frac{1}{9}$
10. $4x$
11. $5x\sqrt{2x}$
12. $13\sqrt{3}$
13. $-2\sqrt{17x}$
14. $5\sqrt{2}$
15. $3\sqrt{2x}$
16. $34\sqrt{2}$
17. $20\sqrt{2} - 5\sqrt{3}$
18. $\frac{\sqrt{10}}{5}$
19. $\frac{39 - 13\sqrt{11}}{-2}$
20. $7\sqrt{5} + 14$
21. $3\sqrt{5} - 3\sqrt{3}$
22. 5
23. -2
24. $-\frac{1}{2}$
25. $2\sqrt[3]{4}$
26. $x\sqrt[3]{x}$
27. $3\sqrt[3]{2}$
28. $2x$
29. $7\sqrt[5]{2}$
30. $\sqrt{2} + 2$
31. 6
32. 6
33. -6
34. 10

EXPONENTS

1. $-18x^9y^5$
2. $\frac{-5a^{11}}{b^3}$
3. $\frac{1}{16x^6y^4z^{10}}$
4. $\frac{y^2}{25x^6}$
5. 1
6. $\frac{y^{11}}{3x^8}$
7. $\frac{-27b^{30}}{a^9}$
8. $\frac{25p^{10}}{16m^4n^{10}}$
9. $s^{\frac{1}{4}}t$
10. $x^{\frac{1}{5}}y$

RATIONAL EXPRESSIONS

1. $\frac{x-1}{x+2}$
2. $\frac{2(x+3)}{3}$
3. $\frac{x+4}{x-5}$
4. $\frac{13}{6(x+2)}$
5. $\frac{x^2+x}{(x+5)(x+3)(x-2)}$
6. $\frac{-x^2-2x+1}{(x+1)(x-1)}$
7. $\frac{x-1}{x+2}$
8. $\frac{1}{3}$
9. $\frac{x}{x+3}$
10. $\frac{-x+14}{7}$
11. $\frac{1}{2}$
12. 3
13. No solution
14. 6, 3

LINEAR EQUATIONS

1. slope = $\frac{3}{4}$

Midpoint $\left(6, \frac{17}{2}\right)$

2. slope = 0

Midpoint $\left(\frac{7}{2}, -2\right)$

3. No slope

Midpoint $\left(5, \frac{1}{2}\right)$

4. $y = 2x - 1$

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

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

7. $y = \frac{4}{3}x + 2$

8. $y = x + 2$

9. $y = 8x + 4$

10. $y = -4x - 42$

11. $y = -5x + 7$

12. $y = 5$

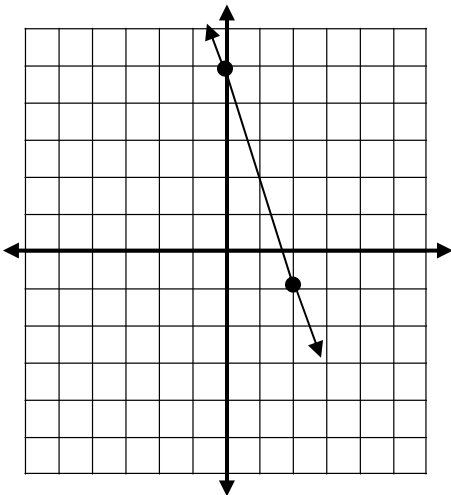
13. $y = 4$

14 - 19 see below

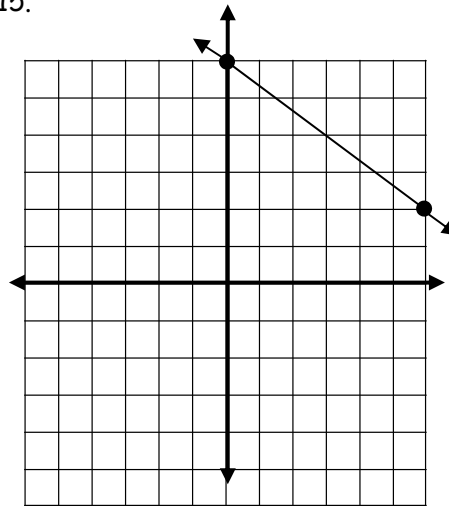
20. $(-2, 3)$

21. $(1, 3)$

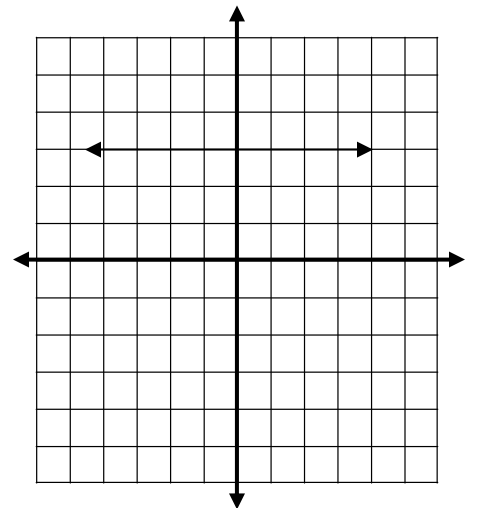
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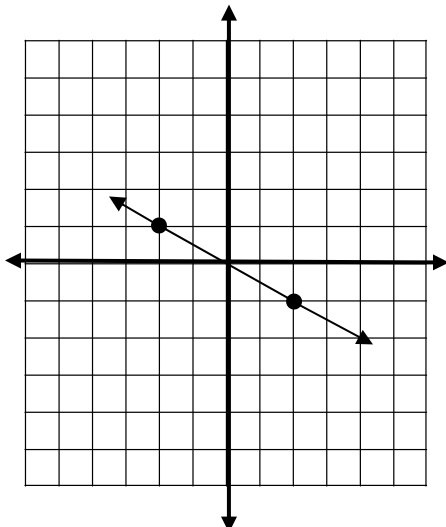
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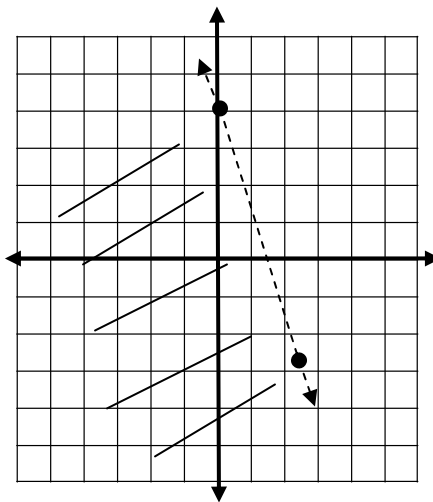
16.



17.



18.



19.

