

This packet is intended to give students an opportunity to recall the main concepts from Algebra I Pre-AP in order to facilitate their transition to Algebra II Pre-AP. Students should be able to complete most of these problems on their own. It may be necessary for the student to consult reference materials (old notes, Algebra I online textbook resources, etc) to refresh their memories.

Students should not attempt to complete the entire packet in one sitting, but should instead do a few problems each day. This packet will be collected for a grade at the beginning of the school year. During the first two weeks of school, there will be a test over the concepts in this packet.

I. Factor each polynomial completely.

1) $a^2 + 11a + 18$

2) $n^2 - 5n + 6$

3) $n^2 + 6n + 8$

4) $5v^2 - 30v + 40$

5) $4v^2 - 4v - 8$

6) $v^2 - 7v + 10$

7) $5x^2 - 18x + 9$

8) $4x^2 - 35x + 49$

9) $6x^2 + 7x - 49$

10) $4x^2 - 4x + 1$

11) $1 - r^2$

12) $n^2 - 25$

13) $343b^2 - 7b^4$

14) $3 + 6b + 3b^2$

15) $49x^2 - 100$

16) $6v^3 - 16v^2 + 21v - 56$

17) $21k^3 - 84k^2 + 15k - 60$

18) $105n^3 + 175n^2 - 75n - 125$

II. Simplify each radical expression.

1) $\sqrt{125}$

2) $\sqrt{216v}$

3) $\sqrt{512k^2}$

4) $\sqrt{512m^3}$

5) $\sqrt{216k^4}$

6) $\sqrt{100v^3}$

7) $\sqrt{147m^3n^3}$

8) $\sqrt{200m^4n}$

9) $\sqrt{28x^3y^3}$

10) $7\sqrt{96m^3}$

11) $\sqrt{36x^2y^3}$

12) $\sqrt{384x^4y^3}$

13) $6\sqrt{72x^2}$

14) $-6\sqrt{150r}$

15) $5\sqrt{80a^2}$

16) $2\sqrt{125v}$

17) $-8\sqrt{24k^3}$

18) $8\sqrt{225x^4}$

19) $\sqrt[3]{-64}$

20) $\sqrt[3]{125}$

21) $\sqrt[4]{10000}$

III. Simplify each expression, giving a justification for each step. Use the worked example as your guide.

Example: $6(12 - 48 \div 4) + 9(1)$

$6(12-12) + 9(1)$	Division in ()
$6(0) + 9(1)$	Simplification
$0 + 9$	Multiplication
9	Addition

1) $2[3(2) - 5] + 3(\frac{1}{3})$

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2) $7[5(3^2) - 11(4)]$

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3) $24(1) - 8 + 5(9 \div 3 - 3)$

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IV. Solve each equation, giving a justification for each step. Use the worked example as your guide.

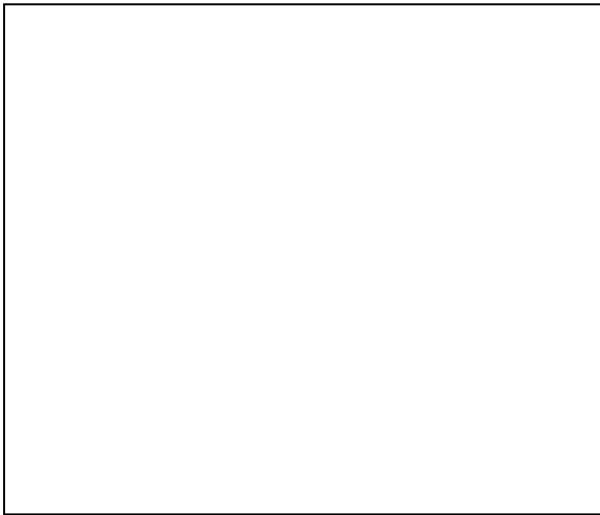
Example: $2(x + 1) + 5 = 8$

$2x + 2 + 5 = 8$	Distributive Prop =
$2x + 7 = 8$	Addition
$2x = 1$	Subtraction Prop =
$x = \frac{1}{2}$	Division Prop =

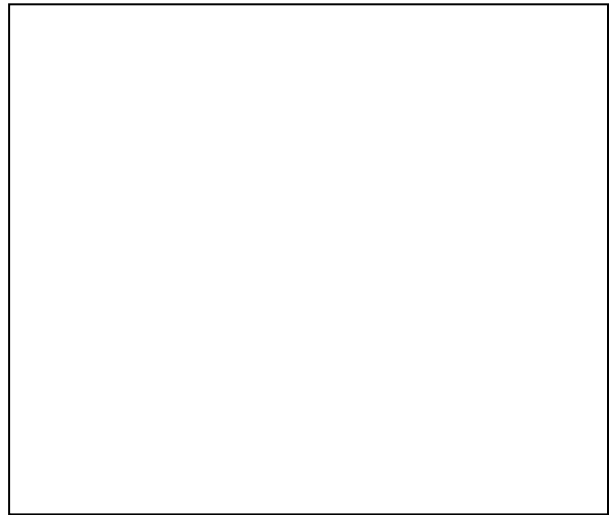
1) $3(x + 2) + 4 = 12$

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$$2) (x + 3)^2 + 5 = 8$$



$$3) (x + 2)(x - 2) = 21$$



V. Use the rules of exponents to simplify each expression. The expressions should contain only positive exponents.

$$1) 2m^2 \cdot 2m^3$$

$$2) 4r^{-3} \cdot 2r^2$$

$$3) 2y^2 \cdot 3x$$

$$4) 4a^3b^2 \cdot 3a^{-4}b^{-3}$$

$$5) 4v^3 \cdot vu^2$$

$$6) (2x^2)^{-4}$$

$$7) (4r^0)^4$$

$$8) (x^2)^0$$

$$9) (2x^4 \cdot y^{-3})^{-1}$$

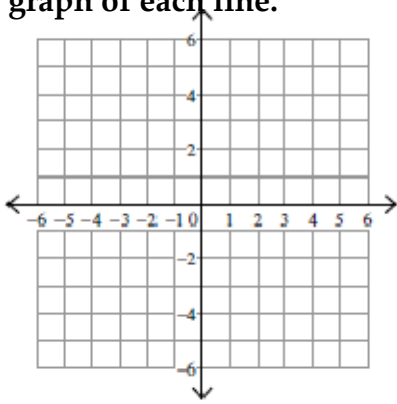
$$10) \frac{r^2}{2r^3}$$

$$11) \frac{4x^0y^{-2}z^3}{4x}$$

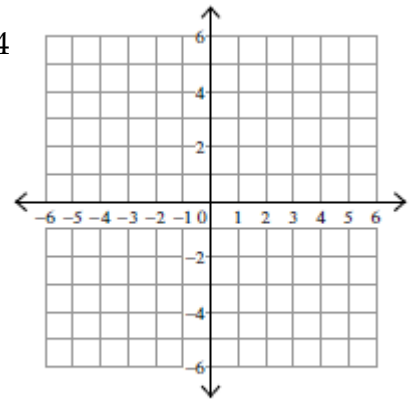
$$12) \frac{3x^3y^{-1}z^{-1}}{x^{-4}y^0z^0}$$

VI. Sketch the graph of each line.

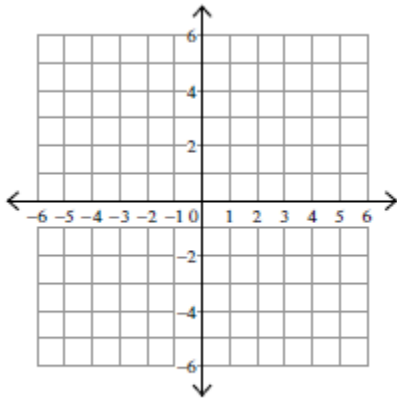
1) $x + y = 4$



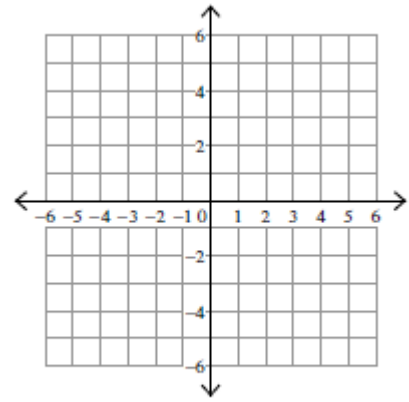
2) $2x + y = 4$



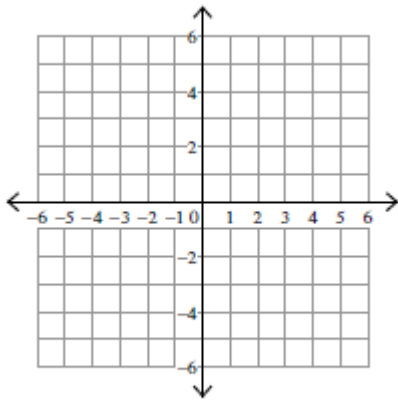
3) $x - 2y = 0$



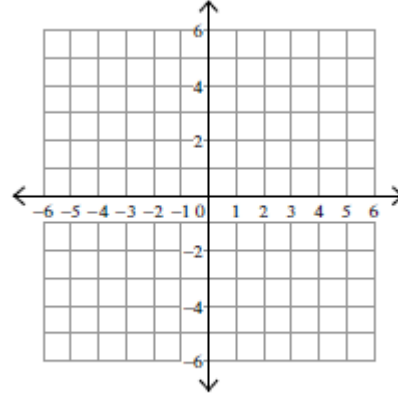
4) $2x + 3y = 6$



5) $5x - 2y = 10$



6) $x = 5 ; y = -2$ (Yes, two lines!!)



VII. Write the slope-intercept form ($y = mx + b$) of the equation for each line.

1) $3x - 2y = -16$

2) $9x - 7y = -7$

3) $11x - 4y = 32$

VIII. Write the standard form ($Ax + By = C$) of the equation of the line that goes through the given point with the given slope.

1) $(1, 2)$; slope = 7

2) $(-2, 5)$; slope = -4

3) $(3, 5)$; slope = $\frac{5}{3}$

4) $(2, 5)$; slope is undefined

IX. Write the point-slope form $(y - y_1 = m(x - x_1))$ of the equation of the line described.

1) passes through $(4, 2)$ and is parallel to $y = -\frac{3}{4}x - 5$

2) passes through $(4, 2)$ and is perpendicular to $y = -\frac{3}{4}x - 5$

3) passes through $(-1, 4)$ and is parallel to $y = -5x + 2$

4) passes through $(-1, 4)$ and is perpendicular to $y = -5x + 2$

X. Solve each system of equations using substitution or elimination.

1) $-4x - 2y = -12$
 $4x + 8y = -24$

2) $x - y = 11$
 $2x + y = 19$

3) $8x + y = -16$
 $-3x + y = -5$

4) $y = 6x - 11$
 $-2x - 3y = -7$

5) $y = -2$
 $4x - 3y = 18$

6) $-3x - 3y = 3$
 $y = -5x - 17$

XI. For each word problem, define the variable and write an equation. Then solve algebraically. It may be helpful to construct charts and tables.

1) A passenger plane made a trip to Las Vegas and back. On the trip there it flew 432 mph and on the return trip it went 480 mph. How long did the trip to Las Vegas take if the return trip took 9 hours?

2) Ryan left the science museum and drove south. Gabriella left the science museum three hours later driving 42 km/h faster than Ryan in an effort to catch up to him. After two hours Gabriella finally caught up. Find Ryan's average speed.

3) Emily mixed together 9 gallons of Tuti-Fruti fruit drink and 8 gallons of Punchy fruit drink, which contains 48% fruit juice. Find the concentration (% juice) of fruit juice in Tuti-Fruti if the mixture contains 30% fruit juice.

4) How many mg of a metal containing 45% nickel must be combined with 6mg of pure nickel to form an alloy containing 78% nickel?