

Algebra Review - prep for ALG II

KEY

Use the following polynomial $2x^5 - 4x^4 + x^2 - 7$ to answer the questions below.

- | | |
|---|-----------|
| 1. a) How many terms are in this polynomial? | <u>4</u> |
| b) What is the leading coefficient? | <u>2</u> |
| c) What is the degree of this polynomial? | <u>5</u> |
| d) What is the coefficient of the second degree term? | <u>1</u> |
| e) What is the constant? | <u>-7</u> |

Simplify each of the following

2. $-3(x^3 - 4x^2 + x - 1) + (4 - 2x + 3x^3)$ 2. $12x^2 - 5x + 7$

$$\underline{-3x^3} + \underline{12x^2} - \underline{3x} + \underline{3} + \underline{4} - \underline{2x} + \underline{3x^3}$$

$$\boxed{12x^2 - 5x + 7}$$

3. $3x^2y - 4x^2 + 2x^2y^2 - 4y^2 + 2x^2y - 5y^2 - 4x^2$ 3. $2x^2y^2 + 5x^2y - 8x^2 - 9y^2$

$$2x^2y^2 + 5x^2y - 8x^2 - 9y^2$$

4. $(2x - 5)(5x + 1)$ 4. $10x^2 - 23x - 5$

$$10x^2 + \underline{2x - 25x} - 5$$

Algebra Review – prep for ALG II

Factor Completely.

5. $x^2 + 6x + 9$

5. $(x+3)^2$

6. $m^2 + 5m - 14$

6. $(m+7)(m-2)$

7. $y^2 - 81$

7. $(y+9)(y-9)$

Evaluate for $a = -1$, $b = 3$, $c = 0.5$ and $d = -\frac{1}{3}$.

8. $2a - 5(c - 3) - 4c + 8d^2$
 $2(-1) - 5(0.5 - 3) - 4(0.5) + 8(-\frac{1}{3})^2$
 $-2 - 5(-2.5) - 2 + 8/9$
 $-2 + 12.5 - 2 + 8/9 = \boxed{9\frac{7}{9}}$

8. $169/18 = 9\frac{7}{18}$

9. $3d - |bc + a|$
 $3(-\frac{1}{3}) - |(3)(0.5) + (-1)|$
 $-1 - |1.5 - 1|$
 $-1 - 0.5 = \boxed{-1.5}$

9. $-1\frac{1}{2} = -\frac{3}{2}$

10. $\frac{2a + 4c}{bd}$

$\frac{2(-1) + 4(0.5)}{(3)(-\frac{1}{3})} = \frac{-2 + 2}{-1} =$

10. 0

$\frac{0}{-1} = \boxed{0}$

Given $f(x) = 2x - 3$ and $g(x) = 2 - x + 2x^2$, complete the following.

11. $f(-5) = 2(-5) - 3$
 $-10 - 3$
 $\boxed{-13}$

11. -13

12. $g(\frac{1}{2}) = 2 - (\frac{1}{2}) + 2(\frac{1}{2})^2$
 $2 - \frac{1}{2} + \frac{1}{2}$
 $\boxed{2}$

12. 2

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Write an equation and solve for the missing variable.

13. Four more than twice a number is seventeen.

$$\begin{aligned} 2n + 4 &= 17 \\ 2n &= 13 \\ n &= 13/2 \end{aligned}$$

13. 13/2 = 6 1/2

14. Six less than a number is the same as 5 more than 3 times the number.

$$\begin{aligned} n - 6 &= 3n + 5 \\ -n - 6 &= -n + 5 \\ \hline -11 &= 2n \\ -11/2 &= n \end{aligned}$$

14. -11/2 = -5 1/2

Solve each of the following equations. Show all work.

15. $4x - 1 = 15$

$$\begin{aligned} 4x - 1 &= 15 \\ +1 &+1 \\ 4x &= 16 \\ \frac{4x}{4} &= \frac{16}{4} \\ x &= 4 \end{aligned}$$

15. 4

16. $6x - 2(x + 1) = 25 - 5x$

$$\begin{aligned} 6x - 2x - 2 &= 25 - 5x \\ 4x - 2 &= 25 - 5x \\ +5x + 2 & \quad \downarrow +2 \quad +5x \\ 9x &= 27 \quad \boxed{x=3} \end{aligned}$$

16. 3

17. $\frac{1}{2}(4x + 12) = 6(x - 1)$

$$\begin{aligned} 2x + 6 &= 6x - 6 \\ -2x + 6 & \quad \downarrow -2x \quad +6 \\ 12 &= 4x \quad \boxed{x=3} \end{aligned}$$

17. 3

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

$$\begin{aligned} 3(2x - 4) &= 5(3 + 2x) \\ 6x - 12 &= 15 + 10x \\ +12 - 6x & \quad \downarrow -6x \quad +12 \\ -12 &= 4x \end{aligned}$$

18. 29/4

$$\frac{-12}{4} = \frac{4x}{4} \quad \boxed{x = -3}$$

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Solve for the specific variable.

19. $P = 2l + 2w$ for the variable w

$$\frac{P - 2l}{2} = \frac{2w}{2}$$

$$\boxed{\frac{P - 2l}{2} = w}$$

19. $\frac{P - 2l}{2}$ OR $\frac{P}{2} - l$

20. $3V = (\pi r^2 h) 3$ for the variable h .

$$\frac{3V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$$

$$\frac{3V}{\pi r^2} = h$$

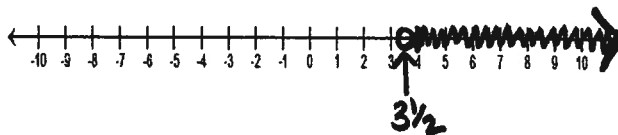
20. $\frac{3V}{\pi r^2} = h$

Solve each of the following inequalities. Then graph on the number line.

21. $2x + 5 > 12$

$$\frac{2x + 5}{2} > \frac{12 - 5}{2}$$

$$\boxed{x > \frac{7}{2} \Rightarrow 3\frac{1}{2}}$$



22. $5(1 - 2x) \geq 15$

$$\frac{5 - 10x}{5} \geq \frac{15}{5}$$

$$\frac{-10x}{-10} \geq \frac{10}{-10}$$

$$\boxed{x \leq -1}$$



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Write an equation of a line in all three forms given the following information.

23. The line contains the points (7, -1) and (-2, 4).

$$m = \frac{-1 - 4}{7 - (-2)} = \boxed{\frac{-5}{9}}$$

$$9(y = -5/9x + 26/9)$$

POINT SLOPE $y + 1 = -\frac{5}{9}(x - 7)$

$$9y = -5x + 26$$

$$+5x \quad +9x$$

$$y + 1 = -\frac{5}{9}x + \frac{35}{9}$$

$$\boxed{5x + 9y = 26} \text{ STANDARD FORM}$$

SLOPE INTERCEPT $y = -5/9x + 26/9$

Point-slope form	Intercept form	Standard form
$y + 1 = -\frac{5}{9}(x - 7)$	$y = -\frac{5}{9}x + \frac{26}{9}$	$5x + 9y = 26$

Solve each of the following – show all work and be sure to answer the question.

24. Kathy paid \$77.72 for 6 pizzas. This included 7% sales tax and a \$1 delivery charge. (The delivery does not get taxed). Find the cost of each pizza.

$$\begin{array}{r} 77.72 \\ - 1 \\ \hline 76.72 \end{array} \text{ DELIVERY CHRG}$$

COST W/ TAX

$$71.70 \div 6 = \boxed{\$11.95}$$

COST OF 6 PIZZAS

COST OF 1 PIZZA

$$\frac{76.72}{x} = \frac{107}{100} \Rightarrow 7672 = 107x$$

$$\boxed{\$71.70 = x} \text{ ORIGINAL COST W/OUT TAX}$$

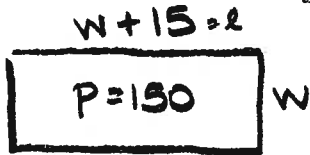
24. \$11.95 a pizza

25. Anthony bikes three miles in 8 minutes, how long will it take him to bike 20 miles?

25. 53 1/3 minutes

Algebra Review – prep for ALG II

26. The perimeter of a rectangle is 150 centimeters. The length is 15 centimeters greater than the width. Write an equation to represent the perimeter of the rectangle. Define each variable used in the equation. Use your equation to find the measures of the length and width.



$$P = 2l + 2w$$

$$150 = 2(w + 15) + 2w$$

$$150 = 2w + 30 + 2w$$

$$150 = 4w + 30$$

$$\begin{array}{r} 150 = 4w + 30 \\ -30 \quad -30 \\ \hline 120 = 4w \end{array}$$

$$\frac{120}{4} = \frac{4w}{4}$$

$$30_{cm} = w$$

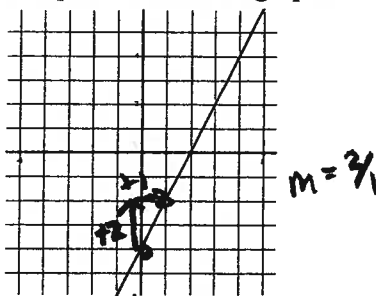
$$l = w + 15$$

$$l = 30 + 15$$

$$l = 45_{cm}$$

26. $w = 30_{cm}, l = 45_{cm}$

27. Write an equation for each graph below



27. $y = 2x + 4$

28. Bowling at Sunset Lanes cost Danny and Susan \$9.00. This included \$0.75 per pair of shoes for shoe rental. How much did each game cost if Danny bowled 3 games and Susan bowled 2 games? Write an equation for the total amount spent at the bowling alley. Define each variable used in the equation.

$g = \text{cost of 1 game}$

$$3g + 2g + 2(0.75) = 9$$

$$5g + 1.5 = 9$$

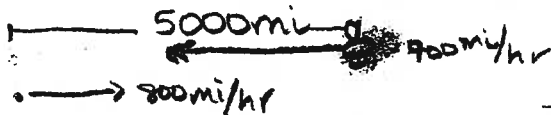
$$\begin{array}{r} 5g + 1.5 = 9 \\ -1.5 \quad -1.5 \\ \hline 5g = 7.5 \end{array}$$

$$\frac{5g}{5} = \frac{7.5}{5}$$

$$g = 1.5$$

28. \$ 1.50 a game

29. Radar detected an unidentified plane 5000 mi away, approaching at 700 mi/h. Fifteen minutes later an interceptor plane was dispatched, traveling at 800 mi/h. How long did the interceptor take to reach the approaching plane?



$$R \times T = D$$

P_1	700	t	$700t$
P_2	800	$t + \frac{1}{4}$	$800t + 200$

$$700t + 800t + 200 = 5000$$

$$1500t + 200 = 5000$$

$$1500t = 4800$$

$$t = 3.2 \text{ hrs}$$

29. $3.2 \text{ hrs} = 3 \text{ h } 12 \text{ min}$

Algebra Review – prep for ALG II

30. The River Rapids Amusement Park offers two discount tickets plans:

PLAN A- \$3.50 per ticket plus \$100 (flat rate) for an all-you-can-eat picnic lunch

PLAN B- \$6.00 per ticket (no meals included)

- a) Write an equation for each plan that will determine the total cost (C), based on the number of students (s) that will purchase tickets.

PLAN A:

PLAN B:

$$C = 3.50s + 100$$

$$C = 6s$$

- b) Create a TABLE OF VALUES for each plan that will illustrate the cost for certain numbers of students:

<u>Plan A</u>		<u>Plan B</u>	
# of students	total cost	# of students	total cost
0	100	0	0
10	135	10	60
20	170	20	120
30	205	30	180
40	240	40	240
50	275	50	300
60	310	60	360
70	345	70	420
80	380	80	480

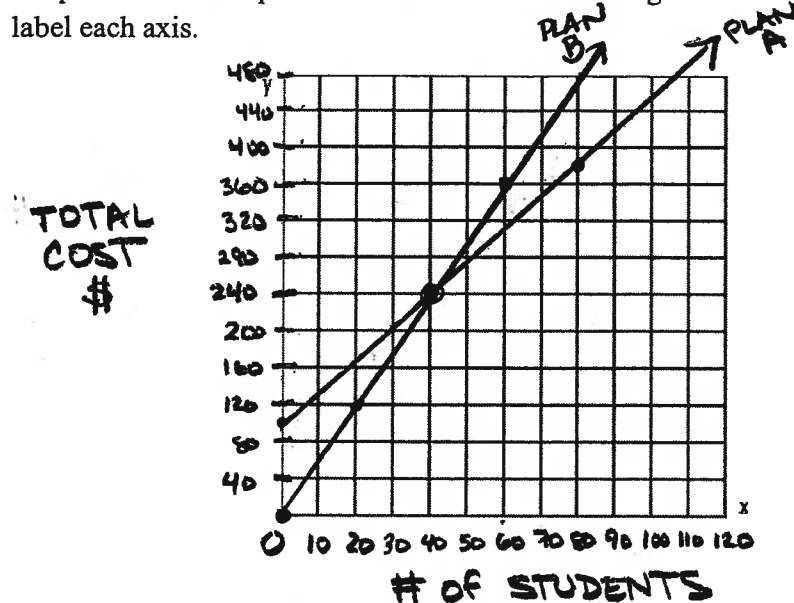
PLAN A
HIGHER
COST

→ SAME

PLAN B
HIGHER
COST

Algebra Review – prep for ALG II

- c) Graph each of the equations on the same coordinate grid. BE sure to correctly label each axis.



- d) For what number of students does PLAN A make the most sense? Explain your response.

PLAN A MAKES THE MOST SENSE FOR GROUPS OF MORE THAN 40 STUDENTS. THE LOWER COST PER STUDENT OVERRIDES THE FLAT RATE OF THE PICNIC COST WHEN MORE THAN 40 STUDENTS GO TO THE AMUSEMENT PARK.

- e) For what number of students does PLAN B make the most sense? Explain your response.

PLAN B MAKES THE MORE SENSE FOR GROUPS OF LESS THEN 40 STUDENTS. WHEN THE GROUPS ARE SMALLER, IT IS NOT WORTH PAYING \$100 FOR A PICNIC.

- f) For what number of students do PLAN A and PLAN B cost the same? Explain your response.

THE PLANS ARE EQUAL AT 40 STUDENTS:

PLAN A
 $C = 3.50(40) + 100$
 $C = 140 + 100$
 $C = \$240$

PLAN B
 $C = 6(40)$
 $C = \$240$

CLEARVIEW REGIONAL

I WOULD TAKE "PLAN A" AT 2009 40 STUDENTS, BECAUSE WE COULD STILL GET LUNCH AS PART OF THE PACKAGE 😊