

Algebra 2B  
Chapter 1 Review  
**NON-CALCULATOR**

(except word problems)

Name key

Date \_\_\_\_\_ Period \_\_\_\_\_

*Name the property illustrated*

- Commutative of mult. 1.  $(7 + x)(3) = (3)(7 + x)$   
Associative of add. 2.  $(15 + 16) + 14 = 15 + (16 + 14)$   
Identity of mult. 3.  $(65)(1) = 65$   
Inverse of add 4.  $43 + (-43) = 0$   
distributive 5.  $10x - 35 = 5(2x - 7)$   
Commutative of add. 6.  $9 + 4 = 4 + 9$   
Identity of add. 7.  $23 + 0 = 23$   
Associative of mult 8.  $(8 \cdot 2) \cdot (5) = (8) \cdot (2 \cdot 5)$   
Inverse of mult. 9.  $(54)\left(\frac{1}{54}\right) = 1$

**Word Bank**

Commutative Property of Add	Associative Property of Mult.	Inverse Property of Add
Commutative Property of Mult.	Identity Property of Add	Inverse Property of Mult.
Associative Property of Add	Identity Property of Mult.	Distributive Property

*Simplify using order of operations*

10.  $15 - 6(-2 + 3 \cdot -6)$   
 $15 - 6(-2 - 18)$   
 $15 - 6(-20)$   
 $15 + 120$   
135

11.  $3(12 \div 6 - 4)^3$   
 $3(2 - 4)^3$   
 $3(-2)^3$   
 $3(-8)$   
-24

12.  $\frac{4 - 3 \cdot -6}{5 \cdot -2 - 1}$   
 $\frac{4 + 18}{-10 - 1} = \frac{22}{-11}$  -2

13.  $3^2 + (-3)^2$   
 $(3)(3) + (-3)(-3)$   
 $9 + 9$   
18

14.  $9 + [4 - (10 - 9)^2]^3$   
 $9 + [4 - (1)^2]^3$   
 $9 + [4 - 1]^3$   
 $9 + (3)^3$   
 $9 + 27$   
36

15.  $1^{11} + 3\left[\left(\frac{22}{11} + 8\right) \div 5\right]$   
 $1 + 3[(2 + 8) \div 5]$   
 $1 + 3[10 \div 5]$   
 $1 + 3(2)$   
 $1 + 6$   
7

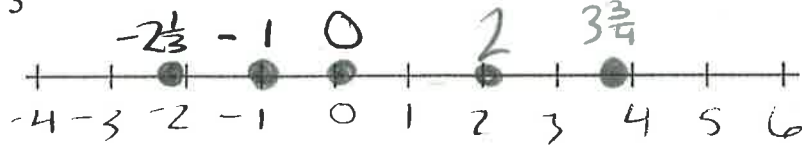
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16. Write the numbers in ascending order:

$$-\frac{3}{2}, 0, \frac{2}{3}, -\frac{2}{3}, -\frac{5}{2}, \frac{1}{5}$$

$$-\frac{5}{2}, -\frac{3}{2}, -\frac{2}{3}, 0, \frac{1}{5}, \frac{2}{3}$$

17. Graph  $0, 2, -1, 3\frac{3}{4}, -2\frac{1}{3}$  on the number line. Each tick mark is an integer.



Determine which set of numbers (Natural, Whole, Integers, Rational, Irrational) that each number belongs to. (N, W, Z, Q, I)

18.  $\sqrt{11}$   
Irrational

19.  $-4\frac{2}{3}$   
rational

20. 216  
Natural  
Whole  
Integers  
rational

Solve and graph.

21.  $\left[\frac{5}{3} - x \leq \frac{3-2x}{2}\right]^6$

$$10 - 6x \leq 3(3-2x)$$

$$10 - 6x \leq 9 - 6x$$

$$1 - 6x \leq -6x$$

$$1 \leq 0$$

Graph: A number line from -6 to 10 with a shaded region to the left of 0.

22.  $4x - 3(3x - 4) \leq -18$

$$4x - 9x + 12 \leq -18$$

$$-5x + 12 \leq -18$$

$$-5x \leq -30$$

$$x \geq 6$$

Graph: A number line from 0 to 10 with a shaded region to the right of 6.

23.  $35 - 5x \leq 0$  and  $5x + 6 \geq -14$

$$\frac{35}{5} \leq \frac{5x}{5}$$

$$7 \leq x$$

Graph: A number line from -6 to 10 with a shaded region to the right of 7.

$$\frac{5x}{5} \geq \frac{-20}{5}$$

$$x \geq -4$$

Graph: A number line from -6 to 10 with a shaded region to the right of -4.

$x \geq 7$  and  $x \geq -4$   
\*Must meet both to be a solution.

24.  $-8 \leq 3y - 20 < 52$

$$\frac{12}{3} \leq \frac{3y}{3} < \frac{72}{3}$$

$$4 \leq y < 24$$

Graph: A number line from 0 to 24 with a shaded region between 4 and 24.

25.  $2x - 3 > 15$  or  $3 - 7x < 17$

$$\frac{2x}{2} > \frac{18}{2}$$

$$x > 9$$

Graph: A number line from -2 to 10 with a shaded region to the right of 9.

$$3 - 7x < 17$$

$$-3 - 3$$

$$-7x < 14$$

$$\frac{-7x}{-7} < \frac{14}{-7}$$

$$x > -2$$

Graph: A number line from -2 to 10 with a shaded region to the right of -2.

\*ONLY Needs to meet ONE

26.  $3x + 4 - 5x > 2x - 12$  or  $16x \geq -2x - 9$   $\mathbb{R}$

$$4 - 2x > 2x - 12$$

$$4 + 12 > 4x - 12 + 12$$

$$16 > 4x$$

$$\frac{4x}{4} < \frac{16}{4}$$

$$x < 4$$

Graph: A number line from -2 to 4 with a shaded region to the left of 4.

$$16x \geq -2x - 9$$

$$12x + 2x \geq -9$$

$$\frac{18x}{18} \geq \frac{-9}{18}$$

$$x \geq -\frac{1}{2}$$

Graph: A number line from -2 to 4 with a shaded region to the right of  $-\frac{1}{2}$ .

OR

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27.  $|x-8| \geq 3$

$x-8 \geq 3$      $x-8 \leq -3$   
 $+8$      $+8$      $+8$      $+8$   
 $x \geq 11$  or  $x \leq 5$

28.  $|3x-2|+7 \leq 5$

$-7$      $-7$   
 $|3x-2| \leq -2$   
 IMPOSSIBLE

29.  $4+|3a+6| \leq 10$

$-4$      $-4$   
 $|3a+6| \leq 6$   
 $-6 \leq 3a+6 \leq 6$   
 $-6$      $-6$      $-6$   
 $-\frac{12}{3} \leq \frac{3a}{3} \leq \frac{0}{3}$   
 $-4 \leq a \leq 0$

30.  $2|2p-1|+6 \geq 16$

$-6$      $-6$   
 $2|2p-1| \geq 10$   
 $|2p-1| \geq 5$   
 $2p-1 \leq -5$   
 $+1$      $+1$   
 $2p \leq -4$   
 $p \leq -2$   
 $2p \geq 6$   
 $p \geq 3$  or  $p \leq -2$

31.  $|x-3| > -2$

$x-3 > -2$      $x-3 < 2$   
 $+3$      $+3$      $+3$      $+3$   
 $x > 1$  or  $x < 5$

32.  $4|3-2(x-1)|=20$

$|3-2x+2| = 5$   
 $5-2x = 5$      $5-2x = -5$   
 $-2x = 0$      $-5-2x = -10$   
 $x = 0$      $x = 5$   
 $x = \{0, 5\}$

33.  $|4x+14| = 6x$

$4x+14 = 6x$   
 $-4x$      $-4x$   
 $14 = 2x$   
 $7 = x$

$4x+14 = -6x$   
 $-4x$      $-4x$   
 $14 = -10x$   
 $-\frac{7}{5} = x$   
 IMPOSSIBLE

34.  $|5-3x| = 4x-9$

$5-3x = 4x-9$   
 $+3x$      $+3x$   
 $5 = 7x-9$   
 $+9$      $+9$   
 $14 = 7x$   
 $2 = x$   
 IMPOSSIBLE

$5-3x = -(4x-9)$   
 $5-3x = -4x+9$   
 $+3x$      $+3x$   
 $5 = -x+9$   
 $-9$      $-9$   
 $-4 = -x$   
 $4 = x$

Evaluate each expression for  $a = -3$ ,  $b = 2$ , and  $c = -1$ .

35.  $2a^2 - (4b + c)$   
 $2(-3)^2 - (4(2) + (-1))$   
 $18 - (8 + -1)$   
 $18 - (7) = 11$

36.  $9(a+2b)^3 + c^5$   
 $9(-3+2(2))^3 + (-1)^5$   
 $9(-3+4)^3 + (-1)$   
 $9(1)^3 + (-1)$   
 $9 - 1 = 8$

Simplify.

37.  $8 - 11(3 - 4x) - 7(5x - 9)$   
 $8 - 33 + 44x - 35x + 63$   
 $-25 + 9x + 63$   
 $9x + 38$

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Solve.

$$38. \left[ \frac{3}{5}k + \frac{1}{10}k = \frac{1}{2}k + 1 \right] 10$$

$$\begin{aligned} (3 \cdot 2)k + k &= 5k + 10 \\ 6k + k &= 5k + 10 \\ 7k &= 5k + 10 \\ 2k &= 10 \\ \boxed{k=5} \end{aligned}$$

$$39. \frac{2}{3}(9x-15) = -40 - 3(4x+2)$$

$$\begin{aligned} 2(3)x - 2(5) &= -40 - 12x - 6 \\ 6x - 10 &= -46 - 12x \\ +46 \quad +46 & \\ \hline 6x + 36 &= -12x \\ -6x \quad -6x & \\ \hline 36 &= -18x \\ \frac{36}{-18} &= \frac{-18x}{-18} \quad \boxed{-2=x} \end{aligned}$$

Solve each equation for the variable indicated.

$$40. SA = 2\pi rh + 2B \quad \text{for } h$$

$$\begin{aligned} SA - 2B &= 2\pi rh \\ \frac{SA - 2B}{2\pi r} &= h \\ \boxed{\frac{SA - 2B}{2\pi r} = h} \end{aligned}$$

$$41. w \left( \frac{m+k}{h} \right) = w(h) \quad \text{for } m$$

$$\begin{aligned} m+k &= wh \\ -k \quad -k & \\ \boxed{m = wh - k} \end{aligned}$$

$$42. y = x^2 + \frac{1}{5}xz \quad \text{for } z$$

$$\begin{aligned} 5(y - x^2) &= \frac{1}{5}xz(5) \\ \frac{5(y - x^2)}{x} &= z \\ \boxed{\frac{5(y - x^2)}{x} = z} \end{aligned}$$

43. Jane's cell phone plan is \$40 per month plus \$.15 per minute for each minute over 200 minutes of call time. If Jane's cell phone bill is \$58.00, for how many total minutes did Jane have for her last bill?

$$\text{total \$} = \text{Monthly payment} + [0.15] \times \# \text{ minutes over 200}$$

$$58 = 40 + .15(x)$$

$$\begin{aligned} -40 \quad -40 & \\ \hline 18 &= .15x \\ \frac{18}{.15} &= \frac{.15x}{.15} \quad x=120 \end{aligned}$$

$$x = \# \text{ minutes over 200}$$

$$\text{total minutes: } 200 + 120 = \boxed{320} \text{ min.}$$

44. Adult tickets to the movies are \$9.50 and student tickets are \$8.00. If there were 75 more adult tickets than students and total receipts were \$2,900, how many adult tickets were sold?

$$\text{total cost} = \text{adult price} \times \# \text{ adults} + \text{Student price} \times \# \text{ students}$$

$x = \# \text{ students}$

$$2900 = 9.50(75+x) + 8(x)$$

$$2900 = 712.5 + 9.50x + 8x$$

$$2900 = 712.5 + 17.5x$$

$$-712.5 \quad -712.5$$

$$2187.5 = 17.5x$$

$$125 = x \Rightarrow$$

$$\text{Adult tickets: } 125 + 75 = \boxed{200} \text{ Tickets}$$

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10. Marty's age is 7 less than twice Pat's age. The sum of their ages is 80. Find their ages.

Pat:  $x = \boxed{29}$

Marty:  $2x - 7 = 2(29) - 7$   
 $= 58 - 7 = \boxed{51}$

$$x + 2x - 7 = 80$$

$$3x - 7 = 80$$

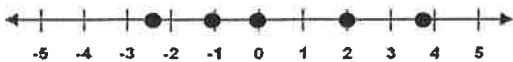
$$\quad +7 \quad +7$$

$$\frac{3x}{3} = \frac{87}{3} \quad x = 29$$

Answers:

1. Comm x
2. Assoc +
3. Identity x
4. Inverse +
5. Distributive
6. Comm +
7. Identity +
8. Assoc x
9. Inverse x

10. 135
11. -24
12. -2
13. 18
14. 36
15. 7
16.  $-\frac{5}{2}, -\frac{3}{2}, -\frac{2}{3}, 0, \frac{1}{5}, \frac{2}{3}$
- 17.



18. I
19. Q
20. N, W, Z, Q
21.  $\emptyset$
22.  $x \geq 6$

23.  $x \geq 7$
24.  $4 \leq y < 24$
25.  $x > -2$
26. Real #'s
27.  $x \leq 5$  or  $x \geq 11$
28.  $\emptyset$
29.  $-4 \leq a \leq 0$
30.  $p \leq -2$  or  $p \geq 3$
31. Real #'s
32.  $\{0, 5\}$
33.  $\{7\}$
34.  $\{4\}$
35. 11
36. 8
37.  $9x + 38$
38.  $\{5\}$
39.  $\{-2\}$

40.  $h = \frac{SA - 2B}{2\pi r}$

41.  $m = hw - k$
42.  $z = \frac{5y - 5x^2}{x}$  or  $z = \frac{5(y - x^2)}{x}$
43. 320 minutes
44. 200 adult tickets
45. Pat 29, Marty 51

