

Algebra 2
Chapter 1 Practice Test

NAME Key

I. Classification

For each given number, please classify each number in as many number sets as possible using the following abbreviations: Real (R), Rational (RA), Irrational (IR), Integer (I), Whole (W).

- | | |
|----------------------|--------------------|
| 1. $\sqrt{11}$ | <u>R, IR</u> |
| 2. -7 | <u>R, RA, I</u> |
| 3. 0 | <u>R, RA, I, W</u> |
| 4. $\frac{-15}{2}$ | <u>R, RA</u> |
| 5. $\sqrt{64}$ | <u>R, RA, I, W</u> |
| 6. $1.\overline{63}$ | <u>R, RA</u> |
| 7. 4 | <u>R, RA, I, W</u> |

II. Properties

Please state the property that is illustrated. (Commutative, Associative, Identity, Inverse, or Distributive)

- | | |
|---------------------------------------|---|
| 8. $10 + 11 + 12 = 12 + 11 + 10$ | 8. <u>comm. (addition)</u> |
| 9. $a \cdot 1 = a$ | 9. <u>identity (multiplicative)</u> |
| 10. $x + (y + z) = (x + y) + z$ | 10. <u>associative</u> |
| 11. $mnp = pnm$ | 11. <u>comm. (multiplication)</u> |
| 12. $x + (-x) = 0$ | 12. <u>^{inverse} identity (additive)</u> |
| 13. $(3c + 2k) + 4p = 3c + (2k + 4p)$ | 13. <u>associative</u> |
| 14. $x - (y + z) = x - y - z$ | 14. <u>distributive</u> |

III. Order of Operations (PEMDAS)

Please simplify each expression with the following values:

$x = 4$ $y = -3$ $z = \frac{1}{2}$

15. $2 + 3(xyz) + 7$
 $2 + 3(4)(-3)(\frac{1}{2}) + 7$

$2 + (-18) + 7$
 $-16 + 7$
-9

16. $3x^2 - y + 2y^2$
 $3(4)^2 - (-3) + 2(-3)^2$
 $3(16) + 3 + 2(9)$
 $48 + 3 + 18$
69

17. $y^2 - 3x + z$
 $(-3)^2 - 3(4) + (\frac{1}{2})$
 $9 - 12 + \frac{1}{2}$
 $-3 + \frac{1}{2}$
-2.5

$$x = 4 \quad y = -3 \quad z = \frac{1}{5}$$

III. continued

18. $z^2 - xy$

$$\left(\frac{1}{5}\right)^2 - (4)(-3)$$

$$\frac{1}{25} + 12$$

$$\boxed{12.25}$$

$$19. 5z - 2x + (2y)^2$$

$$5\left(\frac{1}{5}\right) - 2(4) + (2(-3))^2$$

$$\frac{5}{5} - 8 + (-6)^2$$

$$\frac{5}{5} - 8 + 36$$

$$\frac{5}{5} + 28 = \boxed{30.5}$$

$$20. (2x)^2 + 2x$$

$$(2 \cdot 4)^2 + 2(4)$$

$$64 + 8$$

$$\boxed{72}$$

IV. Applications

21. For 1980 through 1990, the average salary, A , of mental health professionals (in 1000's of dollars) can be modeled by: $A = .35t + 26$, where $t=0$ in 1980.

a. What was the average salary in 1980?

$$A = .35(0) + 26$$

$$A = 26$$

$$\boxed{\$26,000}$$

b. What was the average salary in 1988?

$$A = .35(8) + 26$$

$$A = 2.8 + 26 = 28.8$$

$$\boxed{\$28,800}$$

c. When will the average salary be \$30,900?

$$30,900 = .35t + 26$$

$$4.9 \text{ ~~28,874~~ } = .35t$$

$$\underline{14 \text{ years}} = t$$

$$1980 + 14 = \boxed{1994}$$

V. Solving equations.

Please solve each equation for "x." Circle your answers.

$$22. 2x - 7 = 3x + 2$$

$$-2x - 7 \quad -2x - 2$$

$$\boxed{-9 = x}$$

$$23. 4x + 6x - 8 = 10 - x$$

$$10x - 8 = 10 - x$$

$$\frac{11x}{11} = \frac{18}{11}$$

$$\boxed{x = \frac{18}{11}}$$

$$24. 6(x - 1) = (2 - x)8$$

$$6x - 6 = 16 - 8x$$

$$6x - 6 = 16 - 8x$$

$$-6 = 16 - 14x$$

$$-22 = -14x$$

$$\boxed{\frac{11}{7} = x}$$

$$25. 12 - x + (x + 3) = 5x$$

$$12 - x + x + 3 = 5x$$

$$15 = 5x$$

$$\boxed{3 = x}$$

V. continued

26. $5(3 - 4x) = -8 - (x - 4)$

$$15 - 20x = -8 - x + 4$$

$$15 - 20x = -4 - x$$

$$15 = -4 + 19x$$

$$19 = 19x \quad \boxed{x = 1}$$

28. $\frac{x+a}{b} = a \cdot b$

$$x+a = ab$$

$$\boxed{x = ab - a}$$

27. $6 - 2(x+5) = 18 - x$

$$6 - 2x - 10 = 18 - x$$

$$-4 - 2x = 18 - x$$

$$-4 = 18 + x$$

$$\boxed{-22 = x}$$

VI. Inequalities

Please solve and graph each inequality.

29. $2(3+x) > 1+4x$

$$6 + 2x > 1 + 4x$$

$$6 > 1 + 2x$$

$$5 > 2x$$

$$\boxed{\frac{5}{2} > x}$$

30. $5x - 20 < 2x - 11$

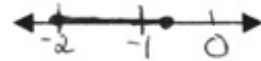
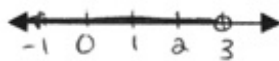
$$3x < 9$$

$$\boxed{x < 3}$$

31. $7 \leq -3x + 2 \leq 8$

$$\frac{5}{-3} \leq \frac{-3x}{-3} \leq \frac{6}{-3}$$

$$-3/5 \geq x \geq -2$$



VII. Absolute Value Equations

Please solve each equation for x, and check your answers.

32. $|x| = 7$

$$\boxed{x = 7 \text{ or } x = -7}$$

33. $\frac{2|x|}{2} = \frac{11}{2}$

$$|x| = 11/2$$

$$\boxed{x = 11/2 \text{ or } x = -11/2}$$

34. $3|x| = -9$

35. $|5 - 2x| = 21$

$$5 - 2x = 21 \text{ or } 5 - 2x = -21$$

$$-2x = 16$$

$$-2x = -26$$

$$x = -8$$

$$\text{or } x = 13$$

36. $|8 - 3x| - 2 = 47$

$$|8 - 3x| = 49$$

$$8 - 3x = 49 \text{ or } 8 - 3x = -49$$

$$\frac{-3x}{-3} = \frac{41}{-3} \quad \frac{-3x}{-3} = \frac{-57}{-3}$$

$$\boxed{x = \frac{-41}{3} \text{ or } x = 19}$$

37. $6|4x| + 3|4x| = 36$

$$\frac{9|4x|}{9} = \frac{36}{9}$$

$$|4x| = 4$$

$$4x = 4 \text{ or } 4x = -4$$

$$\boxed{x = 1 \text{ or } x = -1}$$

VIII. Absolute Value Inequalities.

Please solve and graph each inequality.

$$3x + 4 > -5$$

$$\begin{array}{r} -4 \\ -4 \end{array}$$

$$3x > -9$$

$$x > -3 \text{ or}$$

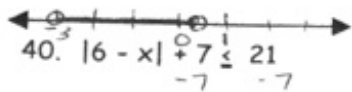
38. $|3x + 4| > -5$

$$\begin{array}{r} 3x + 4 > 5 \\ -4 \quad -4 \end{array}$$

$$3x > 1$$

$$x > \frac{1}{3}$$

** ends up being "between"*



40. $|6 - x| \leq 14$

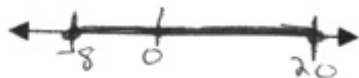
$$-14 \leq 6 - x \leq 14$$

$$\begin{array}{r} -6 \\ -6 \end{array}$$

$$-20 \leq -x \leq 8$$

$$\begin{array}{r} -1 \\ -1 \end{array}$$

$$20 \geq x \geq -8$$



39. $|2x - 5| \geq 1$

$$\begin{array}{r} 2x - 5 \geq 1 \\ +5 \quad +5 \end{array}$$

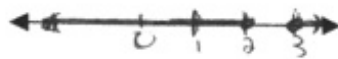
$$2x \geq 6$$

$$x \geq 3$$

$$\begin{array}{r} 2x - 5 \leq -1 \\ +5 \quad +5 \end{array}$$

$$2x \leq 4$$

$$x \leq 2$$

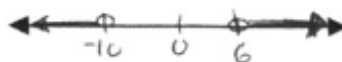


41. $3|2x + 4| - 2|2x + 4| > 16$

$$|2x + 4| > 16$$

$$2x + 4 > 16 \text{ or } 2x + 4 < -16 \Rightarrow 2x > 12 \text{ or } 2x < -20$$

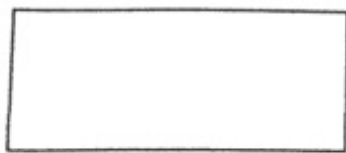
$$x > 6 \text{ or } x < -10$$



IX Area and Perimeter

Please find an expression for either Area (A) or Perimeter (P). Then, evaluate given the values of the variables.

42.



$n + 5$

$2n$

$$P = \frac{2(n+5) + 2(2n)}{2}$$

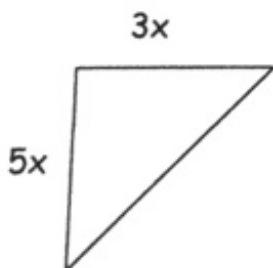
$$\text{or } P = 2n + 10 + 4n$$

$$\text{or } P = 6n + 10$$

given $n = 3$, please find P

$$P = \underline{28}$$

43.



$$A = \frac{1}{2} (3x) (5x)$$

$$A = \frac{1}{2} 15x^2$$

given, $x = 4$, please find A

$$A = \underline{120}$$

$$A = \frac{1}{2} (15) (4)^2$$

$$A = \frac{1}{2} (15) (16)$$

$$A = \frac{1}{2} (240)$$

$$A = \underline{120}$$

$$A = \frac{1}{2} b \cdot h$$