Name: Key Date: Hour:

Algebra 1
Unit 1 Review

Simplify each radical expression.

1. $-2\sqrt{24}$

$4 \cdot 6$, $2 \cdot 2 \cdot 2 \cdot 3$

$-4\sqrt{6}$

2. $6\sqrt{54}$

$6 \cdot 9$, $2 \cdot 3 \cdot 3 \cdot 3$

$18\sqrt{6}$

3. $\sqrt{72}$

$8 \cdot 9$, $2 \cdot 4 \cdot 3 \cdot 3$, $2 \cdot 2$

$6\sqrt{2}$

4. Solve for x: $4(x-2)+6x=12+5x$.

$4x-8+6x=12+5x$

$10x-8=12+5x$

$-5x \quad -5x$

$5x-8=12$

$+8 \quad +8$

$\frac{5x}{5}=\frac{20}{5}$

$x=4$

5. Write and solve an equation to represent the following:
The difference of twice a number and 4 is 8

$2x-4=8$

$+4 \quad +4$

$\frac{2x}{2}=\frac{12}{2}$

$x=6$

Solve each equation.

6. $3(2x-5)=2(3x-2)$

$6x-15=6x-4$

$-6x \quad -6x$

$-15 \neq -4$

no solution

$\varnothing$

7. $4x-3=2x+5$

$-2x \quad -2x$

$2x-3=5$

$+3 \quad +3$

$\frac{2x}{2}=\frac{8}{2}$

$x=4$

8. $\frac{2}{3}x-6=\frac{4}{5}$

$+6 \quad +6$

$\frac{2}{3}x=\frac{34}{5}$

$\frac{2x}{3} \neq \frac{34}{5}$

$\frac{10x}{10}=\frac{102}{10}$

$x=\frac{51}{5}$

9. On the first day of the year, Alicia has $1000 in her savings account and started spending $25 a week. Her sister Kelsey had $650 in her savings account and started saving $15 a week. After how many weeks will the sisters have the same amount? What will that amount be?

$1000 - 25x = 650 + 15x$

$+25x \quad +25x$

$1000 = 650 + 40x$

$-650 \quad -650$

$\frac{350}{40} = \frac{40x}{40}$

$8.75 = x$

8.75 weeks

$650 + 15(8.75)$

$781.25

10. Solve the equation. Write a justification for each step.

Statements	Reasons
$25 = 5(x-3)$	given
$25 = 5x - 15$	DIST. POE
$+15 \quad +15$	Add POE
$\frac{40}{5} = \frac{5x}{5}$	Simplify
$8 = x$	DIV POE
	Simplify

Solve each inequality. Then graph.

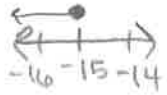
11. $-125 \geq 8p - 5$

$+5 \quad +5$

$\frac{-120}{8} \geq \frac{8p}{8}$

$-15 \geq p$

$p \leq -15$

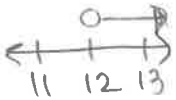


12. $9 + \frac{x}{3} > 13$

$-9 \quad -9$

$3 \cdot \frac{x}{3} > 4 \cdot 3$

$x > 12$



13. $98 < 7(3x + 5)$

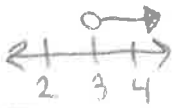
$98 < 21x + 35$

$-35 \quad -35$

$\frac{63}{21} < \frac{21x}{21}$

$x > 3$

$3 < x$



14. $-5(n+1) - 6n \leq 83$

$-5n - 5 - 6n \leq 83$

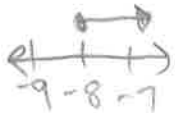
$-11n - 5 \leq 83$

$+5 \quad +5$

$\frac{-11n}{-11} \leq \frac{88}{-11}$

* ÷ by negative

$n \geq -8$



15. $6x - 5(8 - 5x) < 16 + 3x$

$6x - 40 + 25x < 16 + 3x$

$31x - 40 < 16 + 3x$

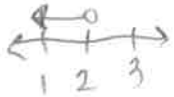
$-3x \quad -3x$

$28x - 40 < 16$

$+40 \quad +40$

$\frac{28x}{28} < \frac{56}{28}$

$x < 2$



16. $3(x+1) \geq 2(-2+x)$

$3x + 3 \geq -4 + 2x$

$-2x \quad -2x$

$x + 3 \geq -4$

$-3 \quad -3$

$x \geq -7$

Solve each compound inequality and graph its solution.

17. $33 > -8x - 7 \geq -79$

$33 > -8x - 7$ $\quad -8x - 7 \geq -79$

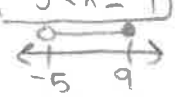
$+7 \quad +7$ $\quad +7 \quad +7$

$40 > -8x$ $\quad -8x \geq -72$

$\frac{40}{-8} > \frac{-8x}{-8}$ $\quad \frac{-8x}{-8} \geq \frac{-72}{-8}$

$-5 < x$ $\quad x \leq 9$

$-5 < x \leq 9$



18. $-15 < -3(x - 2) < 33$

$-3x + 6$

$-15 < -3x + 6$ $\quad -3x + 6 < 33$

$-6 \quad -6$ $\quad -6 \quad -6$

$-21 < -3x$ $\quad -3x < 27$

$\frac{-21}{-3} < \frac{-3x}{-3}$ $\quad \frac{-3x}{-3} < \frac{27}{-3}$

$7 > x$ $\quad x > -7$

$-7 < x < 7$

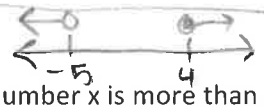
19. $-7x + 7 > 42$ *or* $2 - x \leq -2$

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

$-7x > 35$ $\quad -x \leq -4$

$\frac{-7x}{-7} > \frac{35}{-7}$ $\quad \frac{-x}{-1} \leq \frac{-4}{-1}$

$x < -5$ or $x \geq 4$



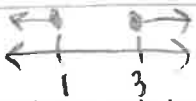
20. $8x - 4 \geq 20$ *or* $5x - 1 \leq 4$

$+4 \quad +4$ $\quad +1 \quad +1$

$8x \geq 24$ $\quad 5x \leq 5$

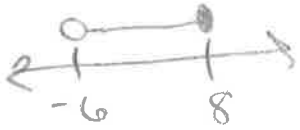
$\frac{8x}{8} \geq \frac{24}{8}$ $\quad \frac{5x}{5} \leq \frac{5}{5}$

$x \geq 3$ or $x \leq 1$



21. A number x is more than -6 and at most 8. Write this sentence as in inequality. Graph the solutions.

$-6 < x \leq 8$



22. You start a small baking business, and you want to earn a profit of at least $250 in the first month. The expenses in the first month are $155. Write and solve an inequality to represent the possible revenues that you need to earn to meet the profit goal?

$-155 + x \geq 250$

$+155 \quad +155$

$x \geq \$405$

23. Your monthly budget allows you to spend between $200 and $450, inclusively. You have already spent $125. Write and solve a compound inequality to represent how much more money you have to spend for the rest of the month.

$200 \leq x + 125 \leq 450$

$\$75 \leq x \leq \$325$

$200 \leq x + 125$ $\quad x + 125 \leq 450$

$-125 \quad -125$ $\quad -125 \quad -125$

$75 \leq x$ $\quad x \leq 325$

Simplify each.

24. $2x^4 \cdot 3x^{-1}$

$6x^3$

25. $\dfrac{x}{4x^{-1}}$

$\dfrac{x^2}{4}$

26. $x^3 \cdot 4x^3$

$4x^6$

27. $3x^0 \cdot x^2y^3$

$3x^2y^3$

28. $\dfrac{3x^{-3}}{3x^{-4}}$

x

29. $\dfrac{n^{-1}}{4n^2}$

$\dfrac{1}{4n^3}$

30. $\dfrac{2r}{r^3}$

$\dfrac{2}{r^2}$

31. $\dfrac{2a^{-4}}{a^{-3}}$

$\dfrac{2}{a}$