Name: Key Date: Hour:

Algebra 1
Unit 1 Review

Simplify each radical expression.

1. $-2\sqrt{24}$

$-2 \cdot 2\sqrt{6}$

$-4\sqrt{6}$

2. $6\sqrt{54}$

$6 \cdot 3\sqrt{6}$

$18\sqrt{6}$

3. $\sqrt{72}$

$6\sqrt{2}$

4. Classify each number (real, rational, irrational, whole, natural, integer).

$-\sqrt{12}$: real, irrational

-3: real, rational, integer

$-5.\overline{66}$: real, rational

0: real, rational, whole, integer

2: real, rational, natural, whole, integer

$-\frac{2}{3}$: real, rational

5. If $4(x-2)+6x=12+5x$, what is the value of $2x-3$?

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

$10x-8=12+15x$

$-10x \quad -10x$

$-8=12+5x$

$-12 \quad -12$

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

$-4=x$

$2(-4)-3$

$-8-3$

-11

6. Write and solve an equation to represent the following:

The quotient of 6 and the quantity of 2 times a number added to 4 is equal to 8

$\frac{6}{2x+4} \times \frac{8}{1}$

$8(2x+4)=6$

$16x+32=6$

$-32 \quad -32$

$\frac{16x}{16}=\frac{-26}{16}$

$x=-\frac{13}{8}$

Solve each equation.

7. $3(2x-5)=2(3x-2)$

$6x-15=6x-4$

$-6x \quad -6x$

$-15=-4$ False

no sol'n

8. $4x-3=2x+5$

$-2x \quad -2x$

$2x-3=5$

$+3 \quad +3$

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

$x=4$

9. $5\left(\frac{2}{3}x\right)-\left(\frac{6}{1}\right)^{15}=\left(\frac{4}{5}\right)^{3}$

$\frac{10}{15}x-\frac{90}{15}=\frac{12}{15}$

$10x-90=12$

$+90 \quad +90$

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

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

10. 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?

$1000-25x=650+15x$

$-650 \quad -650$

$350-25x=15x$

$+25x \quad +25x$

$350=40x$

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

$8.75=x$ weeks

$650+15(8.75)$

$\$781.25$

11. A cyclist travels 56 miles in 4 hours. What is the cyclist speed in feet per minutes?

$\frac{56 \text{ miles}}{4 \text{ hrs}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = \frac{295,680 \text{ ft}}{240 \text{ min}}$

1232 ft/min

12. A cheetah can run at a rate of 180 miles in 2 hours. Find the unit rate in miles per hour.

$\frac{180}{2}=\frac{x}{1} \qquad \frac{180}{2}=\frac{2x}{2}$

$x=90$ mph

13. The ratio of junior varsity members to varsity members on the track team is 3:5. There are 25 varsity members on the team. Write and solve a proportion to find the number of junior varsity members.

JV $\frac{3}{5}=\frac{x}{25}$

V

$\frac{75}{5}=\frac{5x}{5}$

$x=15$ JV

14. Solve the following equation for x: $\frac{x}{2b} - a = 3y$.

$+a \quad +a$

$2b\left(\frac{x}{2b}\right) = (3y + a)2b$

$x = 2b(3y + a)$

$x = 6by + 2ab$

15. Write a justification for each step.

Statements	Reasons
$x + 4 = 8$	given
$-4 \quad -4$	subt. POE
$x + 4 - 4 = 4$	closure
$x + 0 = 4$	inverse
$x = 4$	identity

16. Solve the following equation for y: $-2x - 5y = 15$

$+2x \quad +2x$

$\frac{-5y}{-5} = \frac{2x}{-5} + \frac{15}{-5}$

$y = -\frac{2}{5}x - 3$

17. A jar contains pennies and dimes. The ratios of pennies to dimes is 4 : 7. There are 28 dimes. How many TOTAL coins are there?

$\frac{4}{7} = \frac{x}{28}$

$\frac{7x}{7} = \frac{112}{7}$

$x = 16$ pennies

$D + P = \text{Total}$

$28 + 16 = 44$ coins

(18) $\frac{2}{8} \not= \frac{k+5}{k}$ ← cross multiply

$2(k) = 8(k+5)$

$2k = 8k + 40$

$-8k \quad -8k$

$\frac{-6k}{-6} = \frac{40}{-6}$

$k = \frac{-20}{3}$

(19) $\frac{9}{4} \not= \frac{m-9}{m+2}$

$4(m-9) = 9(m+2)$

$4m - 36 = 9m + 18$

$-4m \quad -4m$

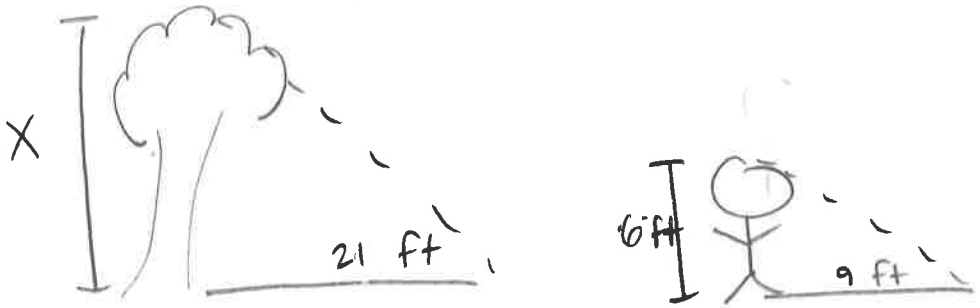
$-36 = 5m + 18$

$-18 \quad -18$

$\frac{-54}{5} = \frac{5m}{5}$

$m = \frac{-54}{5}$

(20) A 6 foot tall man casts a shadow that is 9 feet long. Next to him is a tree that casts a shadow that is 21 feet long. Find the height of the tree.



$\frac{x}{6} = \frac{21}{9}$

$\frac{9x}{9} = \frac{126}{9}$

$x = 14$ ft

(21) Solve for y: $3x + 5y = 30$

$-3x \quad -3x$

$\frac{5y}{5} = \frac{-3x}{5} + \frac{30}{5}$

$y = \frac{-3}{5}x + 6$