Algebra 2-H Review—Chapters 1 and 2 **Do all work on your own paper.

Simplify: 1. $\left(2x^3+3x^2y-4y^3\right)-3\left(x^3-4x^2y+2y^3\right)$ 2. $12\div 3(-4)+3^2\left[-6^2+9\right]\div\frac{3}{4}$

3. Evaluate: $3a^2b+5ab^2$, if $a=-2$ and $b=\frac{-1}{4}$

4. Solve for a: $S=\frac{n}{2}[2a+(n-1)d]$

Use an equation or inequality to solve each problem.

5. Two planes leave an airport at 11 a.m., flying in opposite directions. The speed of one plane averages 20 mph slower than the speed of the other plane. At 12:30 p.m. the planes are 1620 miles apart. Find the speeds for both planes.

6. During a college semester, four 100-point exams will be given. Mike's scores on the first three exams were 85, 92, and 94. What possible scores must Mike earn on the fourth exam so that his test average will be between 90 and 92?

7. Grapes cost 10 cents more per pound than apples. If you buy 3 pounds of grapes and 4 pounds of apples and spend no more than $12, what is the highest possible price per pound for grapes? Round the answer to the nearest cent.

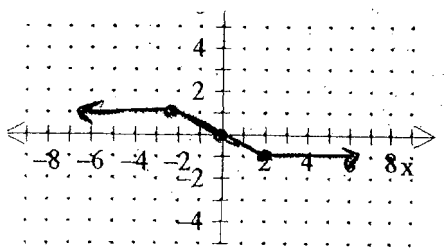
8. Find three consecutive even integers such that three times the second integer is 76 less than twice the sum of the first and third even integers.

Solve and graph. Give your final solution in the simplest form possible.

9. $-4\le 2(3-x)$ *or* $-8(x-5)\ge 8$ 10. $-4<\frac{3x+2}{-4}<\frac{-1}{2}$ 11. $12-2|2-3x|\ge 8$

12. $1<|3x-5|<4$ 13. $2+|2x-1|\ge 14-3|2x-1|$

14. Determine the domain and range of the relation shown below. Is it a function? If so, write a piecewise function for the graph.



15. Determine the domain for $\{(x,y):|y|=4-x\}$.

16. If $f(x)=6x^3+2x^2+5x$, find $f\left(\frac{-2}{a}\right)$. Express the answer as a single fraction.

17. The line $2x-ky=5$ has slope $m=k+1$. Find k.

18. Find k so that the line through $(k, |3k|)$ and $(k-1, k+2)$ has slope $m = 2$.

19. Find k so that the line through $(7, 2k)$ and $(4, -3)$ is perpendicular to the line through $(k+1, 1)$ and $(3, 5)$.

20. Find the x-intercept and y-intercept for the line $\frac{x-3}{2} + \frac{y+2}{3} = 1$.

21. A line with x-intercept k and y-intercept -4 passes through $(4, -3)$. Find k.

22. Write the equation of a line that contains the points $\left(\frac{1}{4}, \frac{-1}{2}\right)$ and $(-2, 1)$. Give the answer in slope-intercept form.

23. Write the equation of a line that passes through $(-3, 2)$ and has undefined slope.

24. Write the equation of a line that contains $(5, -4)$ and is perpendicular to the line $6x - 4y = 9$. Give the answer in standard form.

25. The speed of an automobile in miles per hour (m) varies directly as its speed in kilometers per hour (k).

(a) A speed of 64 mi/hr is equivalent to a speed of 103 km/hr. Write an equation that relates the variables, leaving a fraction in the answer.

(b) What speed in km/hr is equivalent to 40 mi/hr? Round the answer to the nearest tenth.

26. A weight of 2.5 kg stretches a spring to a length of 70 cm, and a weight of 4.5 kg stretches it to a length of 82 cm. Write a linear function $S(w) = mw + b$ for stretched length S as a function of weight w.

Graph in the coordinate plane. 27. $\frac{3}{2}x - \frac{4}{3}y > 2$ 28. $|2y - 4| > 1$

29. $y = \frac{-1}{2}|x+1| - 2$ 30. $f(x) = \begin{cases} x, & \text{if } x < -2 \\ x-2, & \text{if } -2 \le x \le 2 \\ -x, & \text{if } x > 2 \end{cases}$

31. Given: $g(x) = \begin{cases} -x^2 + 3x, & \text{if } x < 2 \\ -4x - 5, & \text{if } x \ge 2 \end{cases}$. Find $g(-10)$.

32. Write the equation for an absolute value function if its graph has vertex $(-1, 0)$ and the graph contains $(2, 2)$.

33. An amusement park charges an admission price (P) based upon age (x). Graph the function $P(x)$, where $P(x)$ is in dollars. Label the axes. $P(x) = \begin{cases} 0, & \text{if } x \le 3 \\ 12, & \text{if } 3 < x \le 17 \\ 18, & \text{if } x > 17 \end{cases}$