

SM2 End-of-Semester Review

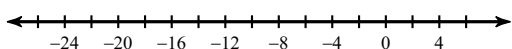
Date _____ Period _____

1) Solve:

$$|n - 10| = 12$$

Write the solution to the inequality in: (a) Simplified inequality notation, (b) Interval notation then (c) graph the solution.

2) $|n + 9| \leq 14$



3) Solve the equation. Show your work.

$$-12 + 6x = 6(3 + 6x)$$

4) Match the Properties to the correct examples of those properties:

- | | |
|-------------------------------|---|
| (a) $4 - 4 = 0$ | (1) Zero Product Property |
| (b) $5 \cdot 0 = 0$ | (2) Identity Property Of Multiplication |
| (c) $6 \cdot 1 = 6$ | (3) Inverse Property of Addition |
| (d) $5 \cdot \frac{1}{5} = 1$ | (4) Inverse Property of Multiplication |

5) a) What error has been made? $4 - (2x + 5) \rightarrow -8x - 20$ b) Write the correct equivalent expression of $4 - (2x + 5)$

6) Explain what the following statement means: "The Real number system is closed for addition, subtraction, and multiplication, but it is not closed for division."

7) The area of a rectangle is 375 square meters. If the width is 22.5 meters:

- What is the length
- What is the perimeter?

8) The area of a trapezoid is given by the following formula:

$$A = \frac{1}{2}h(b_1 + b_2) \quad \text{Solve for } b_1 \text{ (one step rewrite)}$$

9) The area of a trapezoid is 275 square feet. If the height is 11 feet and one base is 12 feet, what is the other base?

10) $\frac{2yx^4}{4xy^{-4}}$

Simplify.

11) $5\sqrt{10}(\sqrt{5} + 3)$

12) $\sqrt{12xy}$

13) $\frac{\sqrt{9}}{4\sqrt{15}}$

14) Rewrite the expression in radical form.

$$3m^{\frac{7}{6}}$$

15) Simplify. Your answer should contain only positive exponents.

$$4x^{\frac{1}{2}}y^2 \cdot 2y^{\frac{2}{3}}$$

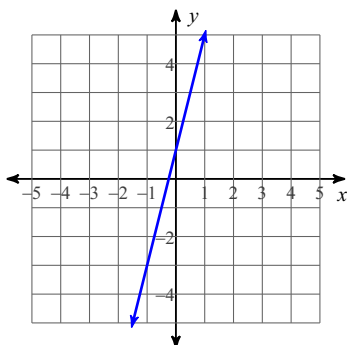
Simplify.

16) $\left(u^2v^{\frac{2}{3}}\right)^{\frac{1}{2}}$

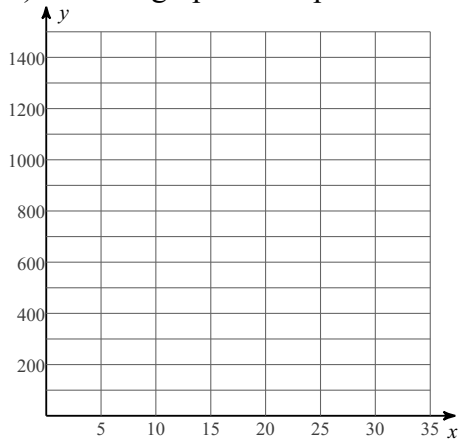
17) Write the slope-intercept form of the equation of the line through the point $(-4, 3)$, and is perpendicular to $y = \frac{2}{3}x - 4$

Write the slope-intercept form of the equation of the line.

18)



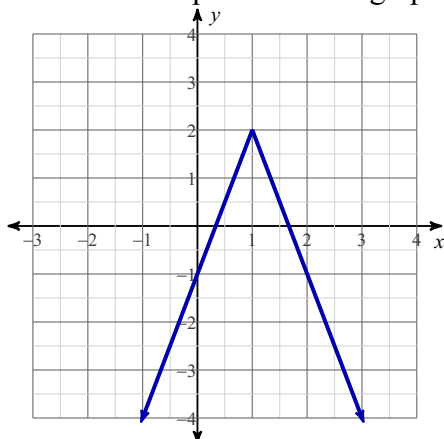
- 19) The cost of hiring a painter, C , is a function of the time spent on the job, 't', in hours. A painter makes a bid on the job. He estimates the paint and materials will cost \$350. If the painter charges for the materials plus \$23 per hour:
- What are the quantities used in the problem?
 - Write an equation that models the situation.
 - If the job takes 32.5 hours, how much will the painter charge?
 - Draw a graph that represents "cost" as a function of "time".



- 20) What is the vertex?
 $y = -2|x - 1| + 4$

- 21) Describe the transformation of the absolute value parent function.
 $y = 3 - 2|x + 4| - 1$

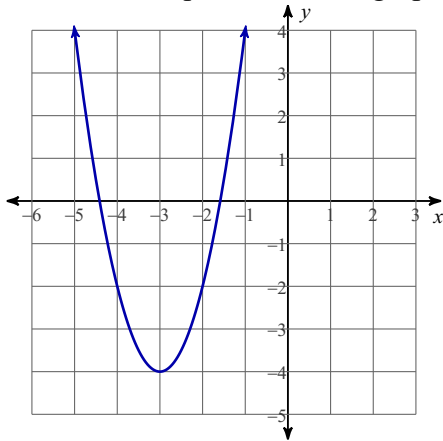
- 22) What is the equation of the graph?



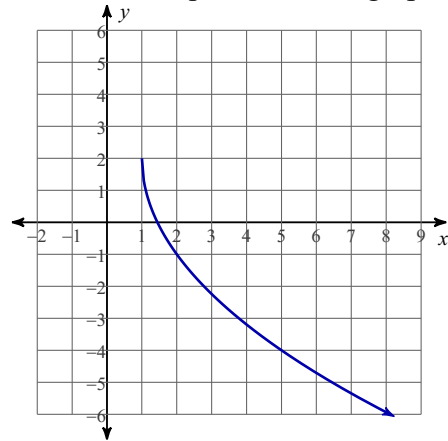
- 23) Convert the following x-y pairs into "function notation".

$(-2, 3), (0, -5)$

24) What is the equation for the graph?



25) What is the equation of the graph?

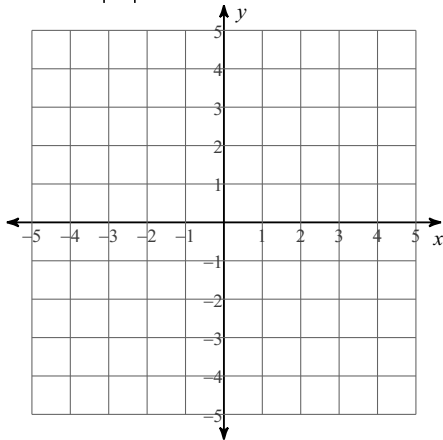


- 26) a) What is the domain?
 b) What is the range?
 c) What is the "endpoint"?

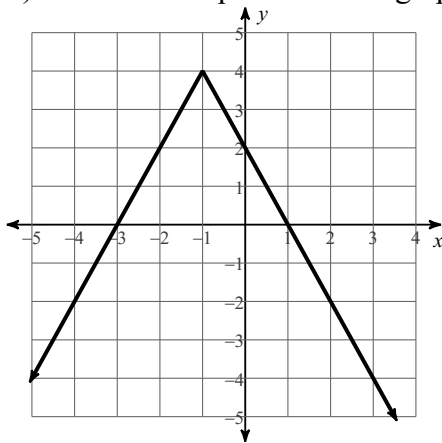
$$y = -3 - 2\sqrt{x + 1}$$

27) Graph the following piece-wise defined function:

$$y = \begin{cases} -x + 2 & \text{for } x \geq 0 \\ -2|x| - 3 & \text{for } x < 0 \end{cases}$$



- 28) a) Where is the function increasing?
 b) Where is the function decreasing?
 c) Where is the function positive?
 d) Is the function even, odd, or neither?
 e) Where are the extrema and what type are they?
 f) How is it related to its parent function?
 g) What is the end behavior? (use "infinity notation")
 h) What is the domain?
 i) What is the range?
 j) What is the average rate of change between $x = 1$ and $x = 3$?
 k) What is the equation of the graph?



Factor each completely.

29) $r^2 - 5r - 50$

30) $5n^2 - 95n + 450$

- 31) a) Convert the equation to intercept form by factoring.
 b) What are the x-intercepts?
 c) Find the vertex using the method I taught in the notes.
 d) Write the vertex form equation.
 $y = x^2 - 10x + 24$

32) Find the product.
 $(4m - 5)^2$

- 33) a) What is the y-intercept?
 b) Factor each completely.
 c) What are the x-intercepts?
 $y = 3x^2 + 13x - 10$

34) Find the zeroes.

$$y = -2(x - 5)^2 + 12$$

- 35) a) Convert the following equation to vertex form.
b) Solve the resulting equation by taking square roots.
 $x^2 - 8x - 23 = 0$

- 36) The width of a rectangle is 2 less than 3 times its length. If the area of the rectangle is 100 square feet:
a) Write the equation that relates the information in the sentence above.
b) Solve by graphing to find the length and width of the rectangle.

- 37) You have 460 feet of fence to build a rectangular corral adjacent to a lake. The side next to the lake is not fenced.
a) Draw an overhead view of the corral with the side lengths labeled (in terms of "x")
b) Write the equation used to calculate the area.
c) What is the maximum area enclosed by the fence?
d) What length and width of the corral?

- 38) A ball is thrown upward from the top of a 100 foot building (10 stories tall) initial velocity of 35 ft/sec. The equation modeling this situation is $h(t) = -16t^2 + 35t + 100$
a) What is the ball's maximum height above ground level?
b) How many seconds after it was thrown will it reach the maximum height?
c) How many seconds after it was thrown will it hit the ground?