Name: _____

DYNAMICS OF TRIGONMETRY
SUMMER PACKET 2026-2027

*This document contains prerequisite material from Algebra I and Algebra II that will support what we learn in Dynamics of Trigonometry. Complete each problem **showing all work**. This completed packet is due the first day of class.*

1. The point where a line crosses the x-axis is called the x-intercept. Likewise, the point where the line crosses the y-axis is called the y-intercept. An easy way to remember how to calculate each one is "the x-intercept occurs when y is equal to zero and the y-intercept occurs when x is equal to zero". Try substituting zero for each variable, one at a time, to solve the problem below.

   Given the equation $3x+2y=12$

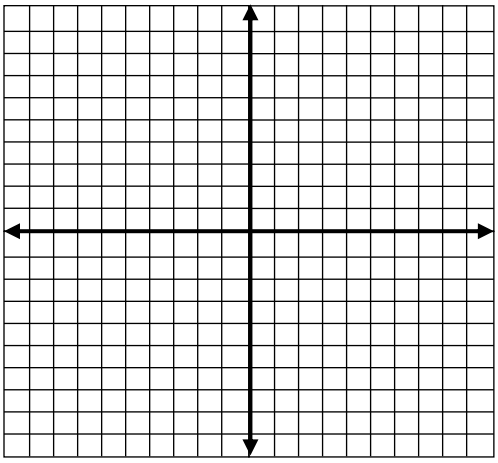
   Find the x-intercept and y-intercept.

2. The slope intercept form of an equation of a line is $y=mx+b$ where m represents the slope and b represents the y-intercept. Write the equation from problem #1 in slope intercept form.

   $3x+2y=12$

3. Using the y-intercept and the slope from problem #2 graph the line

   $3x+2y=12$



4. The equation $y = 50 - 5x$ represents your elevation y in feet for each minute x you hike from a trailhead.

a. Define your variables.
x:_____
y: _____

b. Write this equation in slope intercept form.

c. Graph the equation of the line to model the situation.

d. What does the slope mean in the context of the problem? Are you hiking up or down the mountain?

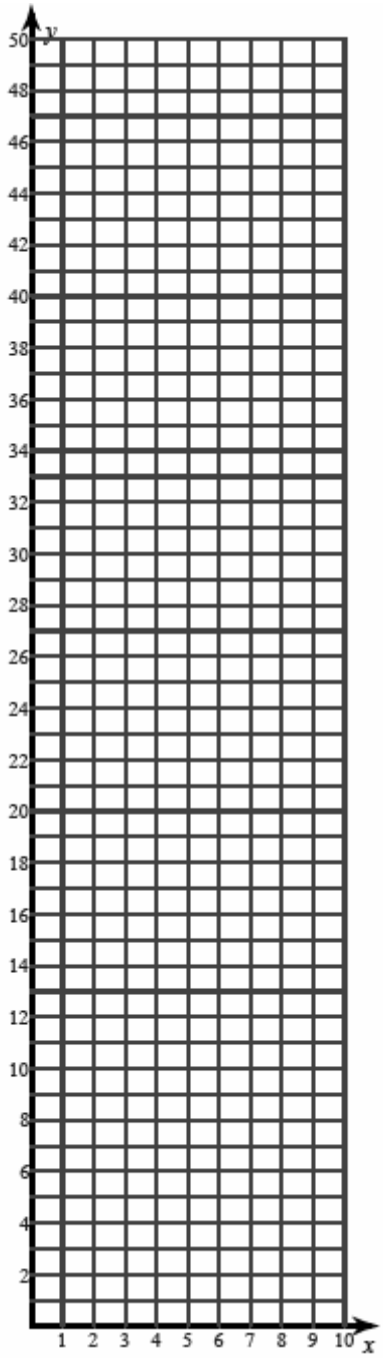
e. What does the y-intercept mean in the context of the problem? (we set _____)

f. What does the x-intercept mean in the context of the problem? (we set _____)

g. In the given problem, what does the point (2,40) represent?

h. According to this model, what elevation are you at after 8 minutes?

i. According to this model, how long have you been walking if you are at 20 ft?



5. When graphing quadratic functions, we use the equation $y = a(x-h)^2 + k$ where a, h and k each have an effect on the graph of a parabola. For the function $y = -(x-1)^2 + 2$, **identify** a, h, and k and **describe** what affect each one has on the graph of $y = x^2$.

   $y = -(x-1)^2 + 2$

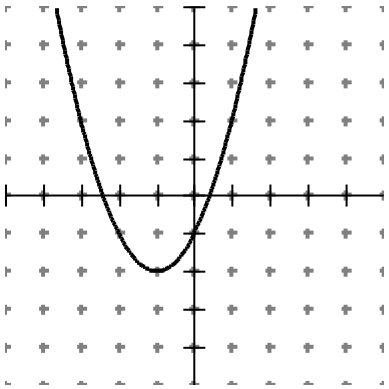
   a=_____

   h=_____

   k=_____

   Choose the graph that supports your description from choices below.

A



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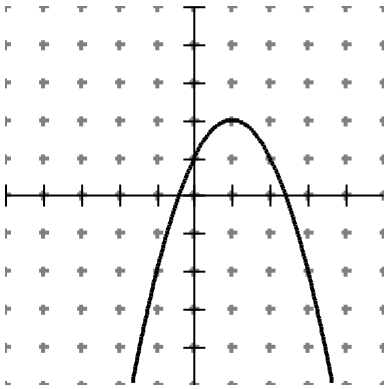

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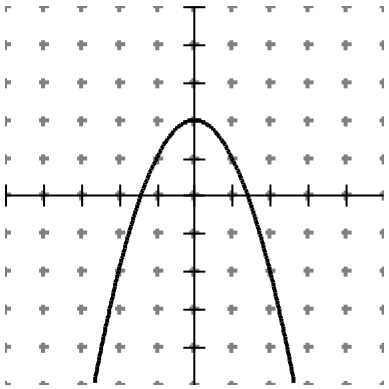
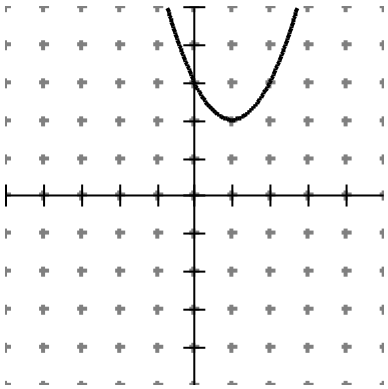


D



6. **Factor**

a. $x^2+8x+16$ b. $x^2-8x+15$ c. $6x^2-17x+5$

d. x^2-16 e. $9x^2-121$ f. $3x^2+9x-30$

7. **Solve for x.**

a. $2x+4=10$ b. $3(x-1)=9x$ c. $\frac{2+x}{3}=x+1$

d. $x^2=121$ e. $-(x+1)=4x+7$

8. **Rationalize and Simplify** the following (keep your answer in radical form).

a. $\frac{1}{\sqrt{3}}$ b. $\frac{4}{\sqrt{20}}$

9. **Solve and graph** the inequality.

a. $3x>-12$ b. $12-7x\geq 9$