Assessment for Functions Grade 11 (MCR3U).

The questions provided cover topics studied in Grade 10 Academic Math (MPM2D) which is a prerequisite course for MCR3U. There are three units in this course: Analytic Geometry, Quadratic Relations and Trigonometry. In Analytic Geometry unit students learn how to solve linear systems and how to solve problems involving the properties of line segments. In Quadratic relations unit students learn the main features of parabola, transformations of $y = x^2$, and how to use the quadratic formula to solve quadratic equations. The Trigonometry unit covers similar triangles, SOH CAH TOA and Sine and Cos Laws. Good Luck for review! The solutions are posted.
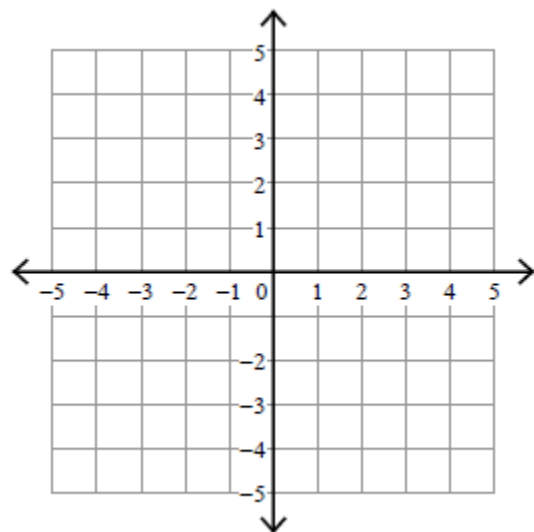
Grade 10 sample questions.

1. A box has twice as many dimes as quarters. The total is $5.40. How many of each type of coin are there?

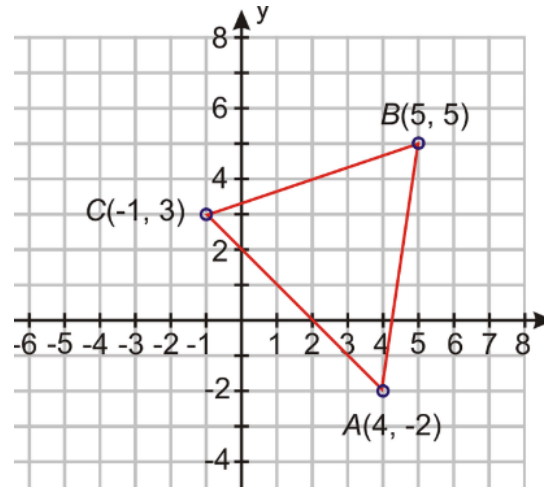|		
10 cents		dime
25 cents		quarter

2. Solve linear system by graphing

$$y = \frac{1}{3}x - 2$$

$$y = -x + 2$$

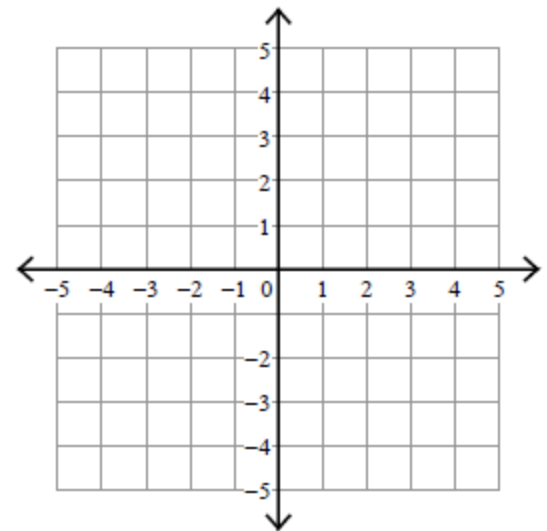3. In geometry, a median of a triangle is a line segment joining a vertex to the midpoint of the opposing side, bisecting it.
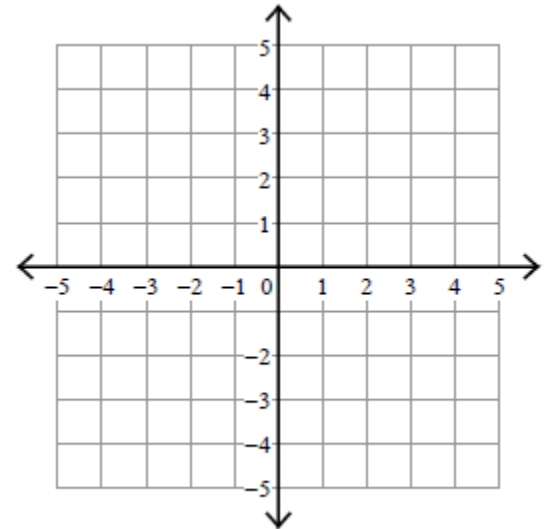   a) Find the midpoint of the line segment CB.

   b) Find the equation of the median from vertex A to the side CB.

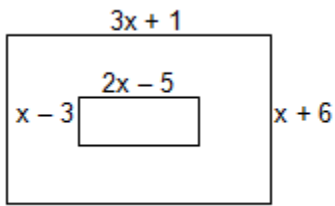4. Determine an equation for each of the following lines in standard form:

a) parallel to the line $y = -4x + 3$ through the point (5,-1)

b) perpendicular to a line with slope $-\dfrac{2}{3}$ and y-intercept -3.

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5. Find the area between the two rectangles.

Dimensions: outer rectangle $3x + 1$ (top) and $x + 6$ (right), $x - 3$ (left); inner rectangle $2x - 5$ (top).
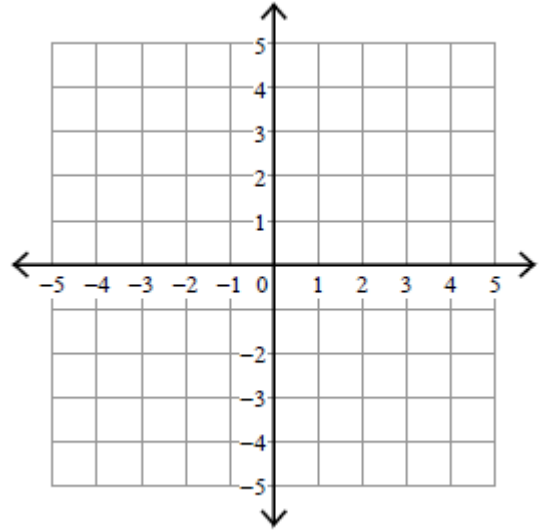
6. A border of uniform width is placed around a rectangular photograph that measures 8 inches by 10 inches. If the area of the border is 144 square inches, what is the width of the border, in inches?

Labels: x, 10 in., 8 in.
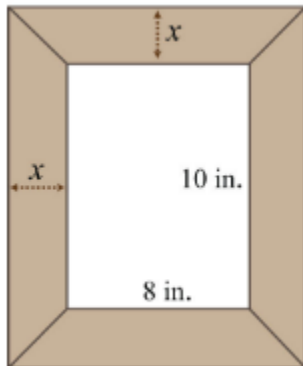
7. Consider $y = -x^2 - 2x + 3$. Answer the questions and then sketch the graph of parabola.

| x	y
-4	
-3	
-2	
-1	
0	
1	

a) What are the x-intercepts? Find x intercepts by factoring the given equation first and compare your results to what you know from the data table.

b) What is the y intercept?

c) What is the vertex of parabola?

8. For a parabola $y = 2x^2 + 4x + 5$, state

   a) axis of symmetry
   b) vertex
   c) direction of opening
   d) maximum/minimum value
   e) horizontal shift
   f) vertical shift
   g) x-intercepts if any
   h) y-intercept
   i) an equation of parabola in vertex form.

$y = 2x^2 + 4x + 5$
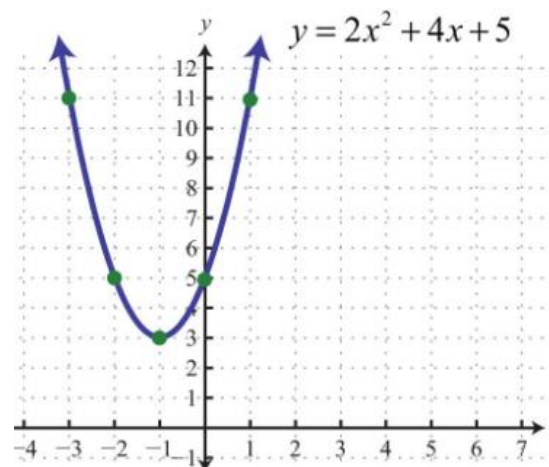
9. The top of a lighthouse is 100 m above sea level. The angle of elevation from the deck of the sailboat to the top of the lighthouse is 28°. Calculate the distance between the sailboat and the lighthouse.
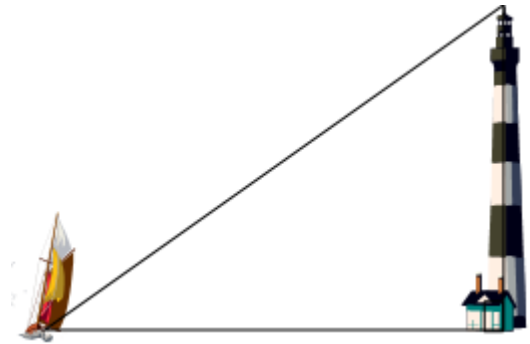
10. Jayveer and Seema are standing 325 m apart, watching a hot air balloon above them. Jayveer measures the angle of elevation to the balloon to be 54 degrees. Seema measure the angle of elevation to the balloon to be 38 degrees.

   a) Sketch the triangle using given information.

   b) How far is each person from the balloon, to the nearest metre?

   c) What is the height of the balloon, to the nearest metre?

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