FOM – Flashback #4

1. An 8" x 10" photograph was scaled by a factor or 5:2. Is this an enlargement or a reduction? What are the new dimensions? By what factor has the perimeter changed by? By what factor has the area changed by?

$K \to 5:2$

$K = \frac{5}{2}$

enlargement because $K > 1$

New dimensions:

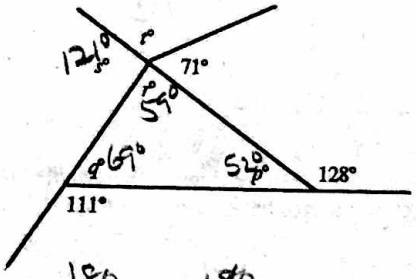
$8 \cdot \frac{5}{2} = \frac{40}{2} = 20"$

$10 \cdot \frac{5}{2} = \frac{50}{2} = 25"$

Perimeter is scaled up by K $(5/2)$

Area is scaled by K^2 $(\frac{5}{2} \cdot \frac{5}{2} = \frac{25}{4})$

2. Determine the angles marked with letters and provide a reason for each.



52 + 69 = 121

180 − 121 = 59

180 − 59 = 121°

180 − 71 = 109

$\angle p = 52°$ supp $\angle$s to 128°

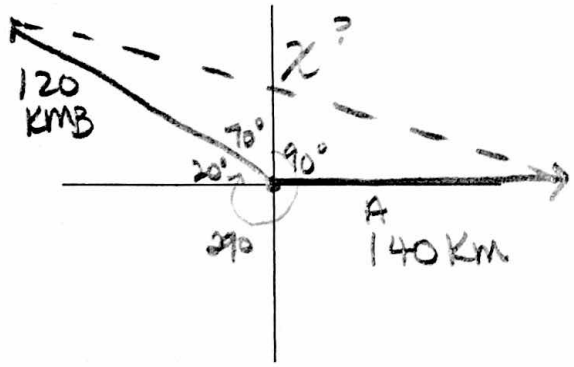
$\angle q = 69°$ supp $\angle$s to 111°

$\angle r = 59°$ $\triangle = 180°$

$\angle s = 121°$ supp $\angle$s to $\angle r$

$\angle t = 109°$ supp $\angle$ to 71° or $\angle$s around a point = 360°

3. Two aircraft, A and B, leave an airport at the same time. A flies on a course of 90° at 700 km/hr and B flied on a course of 290° at 600 km/hr. Draw a diagram to show the positions of the aircraft after 12 minutes. How far has each airplane travelled? How far apart are they?



$A = 700 \frac{Km}{hr} \cdot \frac{1 hr}{60 min} \cdot 12 min = 140 Km$

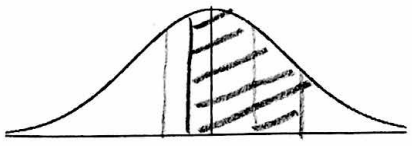
$B = 600 \frac{Km}{hr} \cdot \frac{1 hr}{60 min} \cdot 12 min = 120 Km$

$a^2 = b^2 + c^2 - 2bc \cos A$

$a^2 = 120^2 + 140^2 - 2(120)(140)\cos 160$

$a^2 \doteq 49784.836$ $\quad a \doteq 223.13$ Km

4. Given a normal curve, shade in the area between the z-score of 2 and -1.5. Give the area as a decimal and as a percent. Label the diagram.



zscore = 2 → 0.9772

zscore = -1.5 → 0.0668

$0.9772 - 0.0668 = 0.9104 \to 91.04\%$

$y = a(x-p)^2 + q$ vertex (p, q)

5. Write the equation of a quadratic function in standard form with the following characteristics:
   a) Vertex at (6,4)
   b) Vertex of (3, -5) and opening down
   c) Vertex at the origin
   d) Opening up with no x intercept

a) $y = a(x-6)^2+4$ ← any number $a \neq 0$ → $\boxed{y = (x-6)^2+4}$

b) $y = -a(x-3)^2-5$ ← any positive number → $\boxed{y = -2(x-3)^2-5}$

c) $y = a(x-0)^2+0$

$y = ax^2$

$\boxed{y = x^2}$

d) $y = a(x-p)^2+q$ — a: any positive #; q: must be positive

$y = 2(x+4)^2+7$

(x, y) ↑ any

6. Determine the roots of the equation $2x^2 - 8x + 5 = 0$.
   a b c

factor

$(2x - 5)(x - 1) = 0$

doesn't factor so must use Quadratic formula

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-(-8) \pm \sqrt{64-4(2)(5)}}{4}$

exact roots: $x = \frac{8 \pm \sqrt{24}}{4}$ Aprox roots: $x \doteq 3.22$ and $x = 0.775$

7. Graph the inequality $2x - y > 6$ and $x < 2$
   List three possible solutions for this system and prove algebraically.

$2x - y > 6$

$2x - 6 > y$

↑ Slope $\frac{2}{1}$ ↑ y-int ↑ dashed line

Shading

test (0,0)

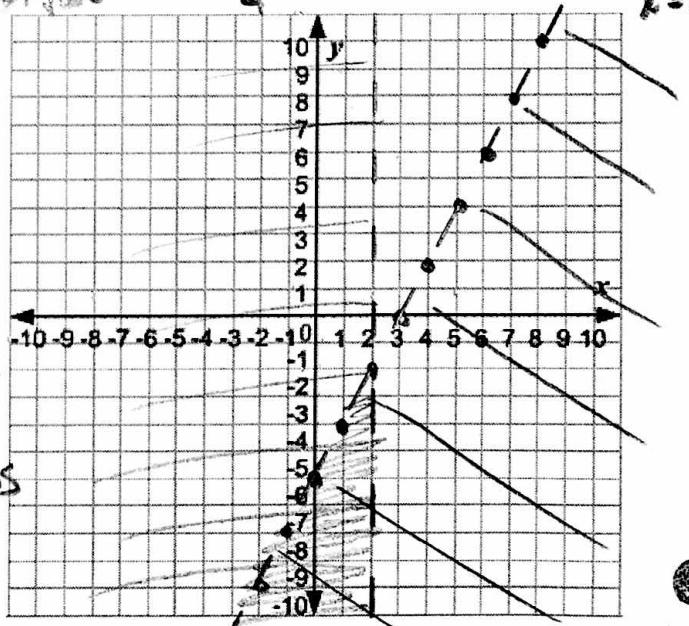
$2(0) - 0 > 6$

false

↳ Shade below

$x < 2$ ← dashed

↓ vertical line



Possible Solutions

$(1, -5)$ $(0, -7)$ $(-1, -10)$

$2(1) - -5 > 6$

$2 + 5 > 6$

$1 < 2$ ✓

$2(0) - -7 > 6$

$0 + 7 > 6$

$0 < 2$ ✓

$2(-1) - -10 > 6$

$-2 + 10 > 6$

$-1 < 2$ ✓