Exercise 1: (2 ptos) Work out:

a) $\dfrac{\log_2 9 + \log_2 27}{\log_2 405 - \log_2 5} = \dfrac{5}{4}$

b) $\log_5 \dfrac{\sqrt[7]{25} \cdot \sqrt[5]{625}}{\sqrt{125}} = \dfrac{-29}{70}$

Exercise 2: (1.25 ptos) If $\tan \alpha = 0.75$ find the values of the other five trigonometric functions and the angle α

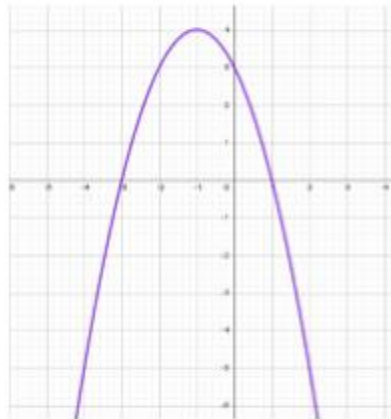|		
$\cos \alpha = 0.8$	$\sin \alpha = 0.6$	$\alpha = 36.87°$
$\sec \alpha = 1.25$	$\cot \alpha = 1.33$	$\csc \alpha = 1.67$

Exercise 3: (1 pto) Find the **general** equation of the straight line that goes through the points $P(4,-3)$ and $Q(6,8)$ $\qquad 11x - 2y - 50 = 0$

Exercise 4: (1 pto) Sketch the graph of the parabola $y = -x^2 - 2x + 3$, indicating its curvature, finding the points where it crosses the axes, the coordinates of the vertex, and as many more points as needed

**Exercise 7: (1 pto)** Find the missing sides without using a calculator:
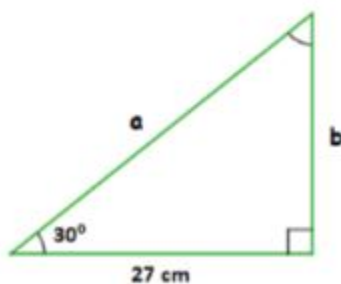
$a = 18\sqrt{3}$

$b = 9\sqrt{3}$

Exercise 5: (1.5 ptos) Woke up last night and there was a strange light illuminating the garden. Got out and I couldn't believe my eyes as I saw a spaceship hovering above. How high up was it, I wondered. Was it safe to come nearer? Half asleep, I got my goniometer out of the pocket of my pajamas and measured the angle: $73.74°$. Then I silently walked 90 m to the other side of the garden and measured the angle again: $65.37°$. So, how far above the ground is the UFO standing?   **120 m**

65.37°   73.74°

90 m
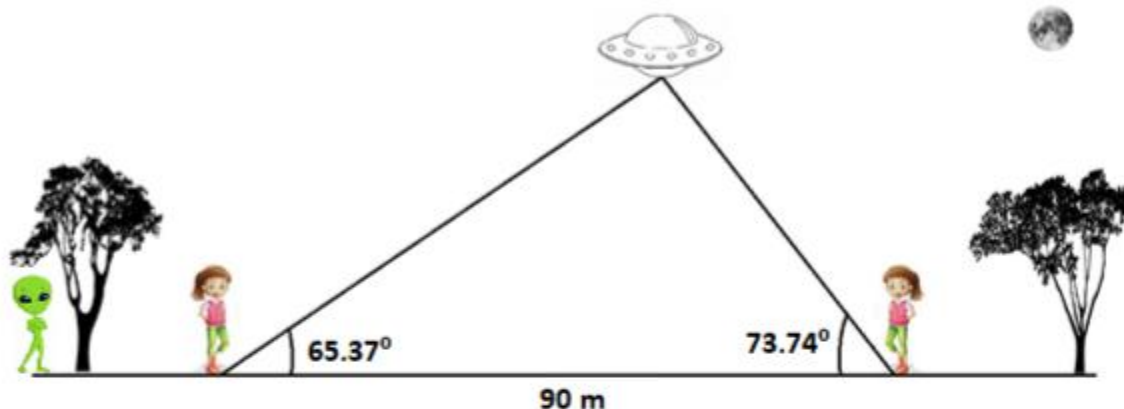
Exercise 6: (2.25 ptos) Sketch the graph of the following piecewise function:

$$f(x) = \begin{cases} 1 & x < -1 \\ 3^x & -1 \leq x < 2 \\ \dfrac{1}{x-2} & 2 < x < 6 \end{cases}$$