FUNCTIONS AND TRIGONOMETRY TEST

4° ESO

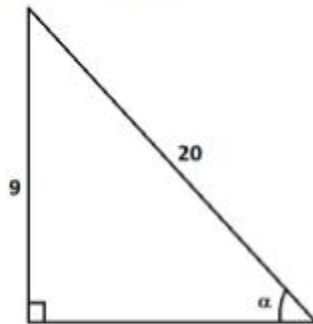**Exercise 1: (2 ptos)** Sketch the graph of the piecewise function:

$$f(x) = \begin{cases} x+2 & x < 0 \\ \log_2 x & 0 < x \leq 4 \\ \dfrac{2}{x-4} & 4 < x < 12 \end{cases}$$

Exercise 2: (2.25 ptos) Work out using the properties of logarithms:

a) $\dfrac{\log_5 27 + \log_5 3}{\log_5 2187 - \log_5 81} =$

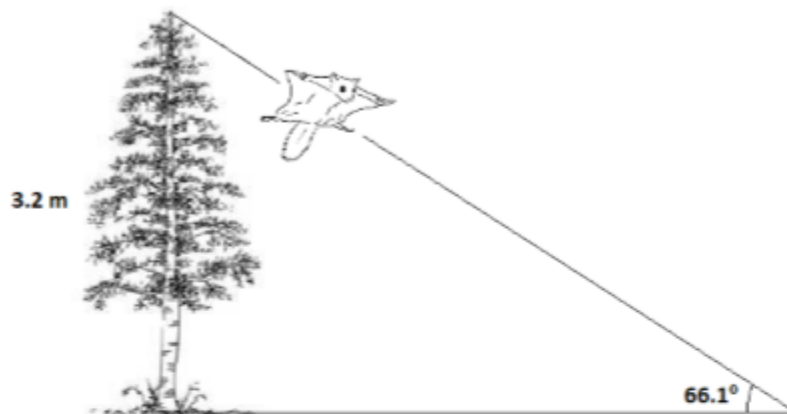b) $\log_7 \dfrac{\sqrt{7} \cdot \sqrt[9]{49}}{\sqrt[5]{2401}} =$

Exercise 3: (1.5 ptos) Find the six trigonometric functions of the angle α with four decimal figures
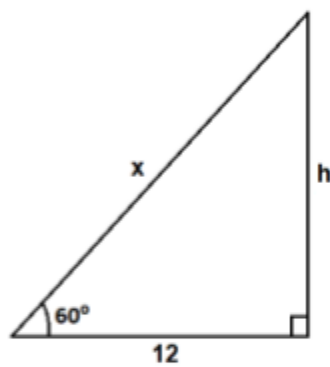

Exercise 4: (1.25 ptos) Find the area of a regular octagon with sides of length 14 cm.

Exercise 5: (1.25 ptos) If $\tan \alpha = 1.75$ find the values of $\sin \alpha$, $\cos \alpha$ and the angle α expressed using degrees, minutes and seconds. Round to four decimal figures.

Exercise 6: (0.75 ptos) My squirrel is learning to fly and since she knows a lot of Math, she wants to know the distance from the top of the tree to the ground, making a straight line (not vertical!!!). She measured the angle with the goniometry in her eyes and she got a value of $66.1°$. Now she's ready to jump. Knowing that the height of the tree is of 3.2 m, do you think that she will she make it?

3.2 m

66.1°

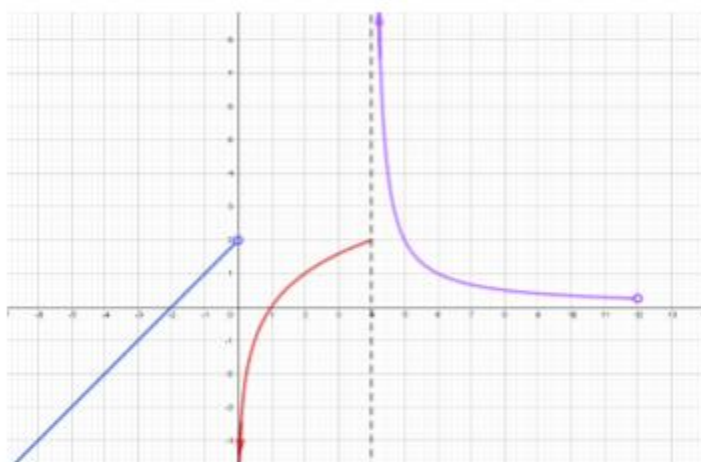**Exercise 7: (1 pto)** Find the lengths of the missing sides without using a calculator:

x

h

60°

12

Exercise 1: (2 ptos) Sketch the graph of the piecewise function:

$$f(x)=\begin{cases} x+2 & x<0 \\ \log_2 x & 0<x\le 4 \\ \dfrac{2}{x-4} & 4<x<12 \end{cases}$$
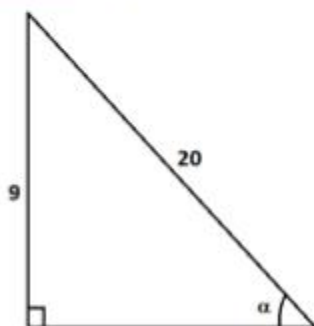

Exercise 2: (2.25 ptos) Work out using the properties of logarithms:

a) $\dfrac{\log_5 27 + \log_5 3}{\log_5 2187 - \log_5 81} = \dfrac{4}{3}$

b) $\log_7 \dfrac{\sqrt{7}\cdot\sqrt[9]{49}}{\sqrt[5]{2401}} = \dfrac{-7}{90}$

Exercise 3: (1.5 ptos) Find the six trigonometric functions of the angle α with four decimal figures:

$\sin\alpha = 0.45 \;\rightarrow\; \csc\alpha = 2.2222$

$\cos\alpha = 0.45 \;\rightarrow\; \sec\alpha = 1.1198$

$\tan\alpha = 0.5039 \;\rightarrow\; \csc\alpha = 1.9844$

Exercise 4: (1.25 ptos) Find the area of a regular octagon with sides of length 14 cm $\quad A_O = 946.37 \text{ cm}^2$

Exercise 5: (1.25 ptos) If $\tan\alpha = 1.75$ find the values of $\sin\alpha$, $\cos\alpha$ and the angle α expressed using degrees, minutes and seconds. Round to four decimal figures.
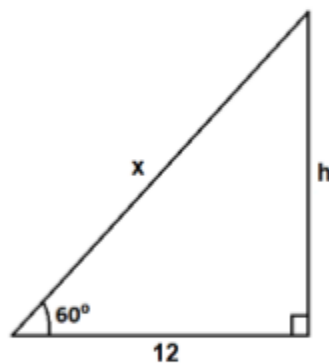
$$\cos\alpha = 0.2462 \qquad \sin\alpha = 0.8682 \;\rightarrow\; \alpha = 60°15'18''$$

Exercise 6: (0.75 ptos) My squirrel is learning to fly and since she knows a lot of Math, she wants to know the distance from the top of the tree to the ground, making a straight line (not vertical!!!). She measured the angle with the goniometry in her eyes and she got a value of $66.1°$. Now she's ready to jump. Knowing that the height of the tree is of 3.2 m, do you think that she will she make it?
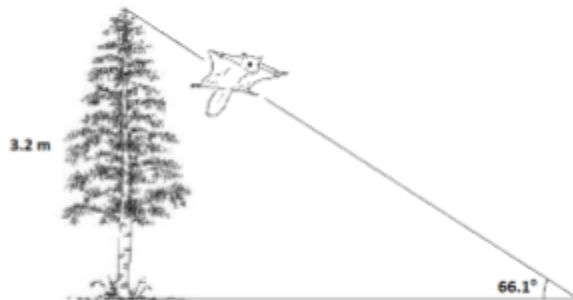
$x = 3.5$ m, so I am sure that she will make it because I do trust my squirrel

3.2 m

66.1°

Exercise 7: (1 pto) Find the lengths of the missing sides without using a calculator:

x

h

60°

12

$x = 24$

$h = 12\sqrt{3}$