MHF – 4U QUIZ#10 (Knowledge & Understanding) Name [redacted]

$\frac{17}{24}$

71%

1. Convert to radians. a) using π and fraction b) to three decimals

(2)

a) 400^0

$400 \times \frac{\pi}{180} = \frac{400\pi}{180}$ → $\frac{20\pi}{9}$ or 6.981 radians

b) 228^0

$228 \times \frac{\pi}{180} = \frac{228\pi}{180} = \frac{19\pi}{15}$ or 3.979 radians

2. Convert to degrees. **One decimal.**

(2)

a) $\frac{-7\pi}{10}$ rad

$\frac{-7\pi}{10} \times \frac{180}{\pi} = -126°$

b) 5.5 rad

$5.5 \times \frac{180}{\pi} = \frac{990}{\pi} = 315.1°$

3. For $\tan\theta = \frac{-1}{\sqrt{3}}$, find θ in radians in **fractional, radical** form, if $0 \le \theta \le 2\pi$.

Use **special triangles**. Complete a sketch. No decimals- fraction(s) with π.

(4)

$\tan\theta = \frac{y}{x}$

$y = -1$, $x = \sqrt{3}$ or $y = 1$, $x = -\sqrt{3}$

$\tan\theta = \frac{-1}{\sqrt{3}} = \frac{y}{x}$

$\tan^{-1}\theta = \frac{-1}{\sqrt{3}}$

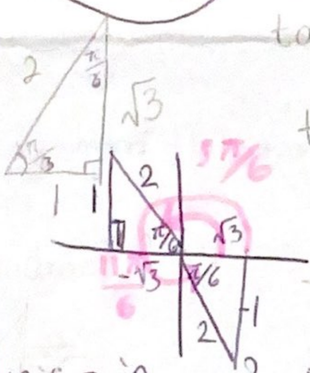
~~θ = −0.5773502691 rad~~

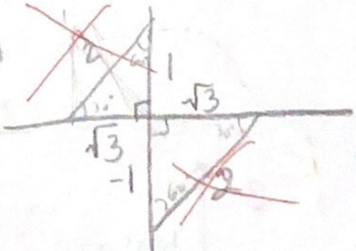
$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$

→ $\theta = \frac{\pi}{3}$

$\tan\frac{\pi}{3} = \frac{O}{A} = \frac{1}{\sqrt{3}}$

- can only find exact values with special Δ, ex. if $\frac{5}{13}$ you cannot use Δ, use calculator



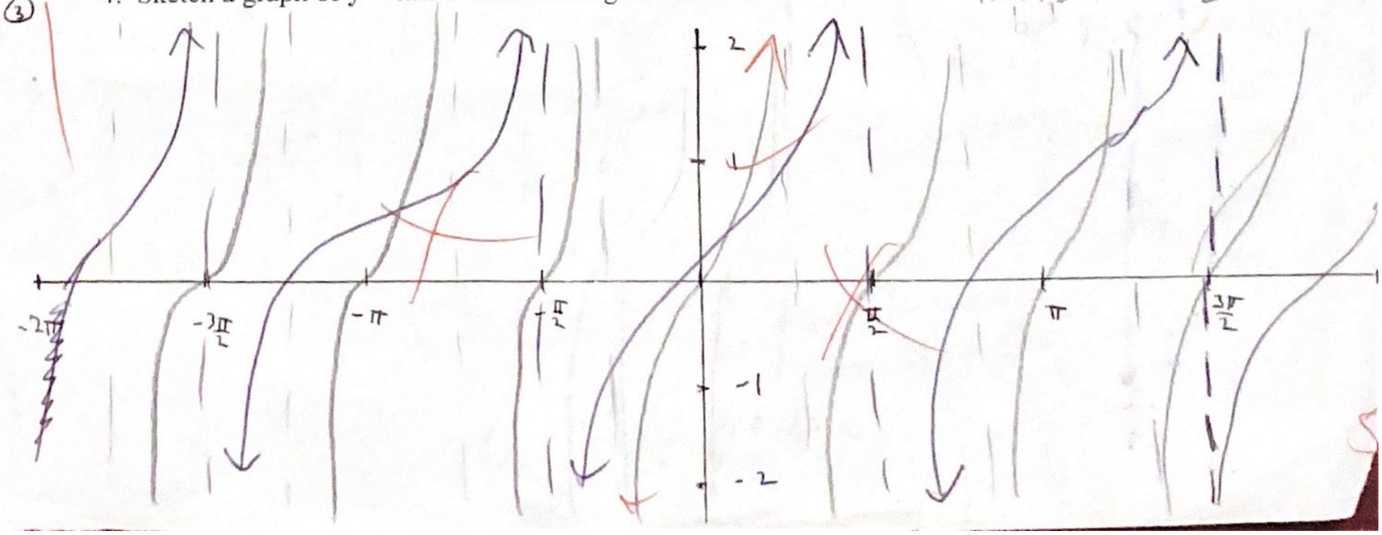


tan is − in qu 2 or 4

tan is − in qu. 2 or 4

4. Sketch a graph of **y = tan θ** and on the grid below.

(3)



(5)

5. The graph of y = cos x is transformed by vertically stretching it by a factor of 4.5, reflecting it in the x-axis, having a period of $\frac{1}{5}$, phase shift $\frac{\pi}{9}$ to the left, and vertically translating it 7 units down. Write the equation of the resulting graph.

$\frac{1}{5} = \frac{2\pi}{k}$

k value $= \frac{2\pi}{1/5}$

$y = \cos x$

Vertical stretch (a) = 4.5

reflection in x (-4.5)

Period = divided by 10π

left $\frac{\pi}{9}$, vertically down 7

$y = -4.5 \cos 10\pi\left(x + \frac{\pi}{9}\right)$

6. Graph the following equation on the grid given. Set up appropriate scales and show all transformations.
{ $0 \le \theta \le 2\pi$ }

(8)

$$y = 6\sin\left(2\theta + \frac{\pi}{2}\right) + 10$$

a=6

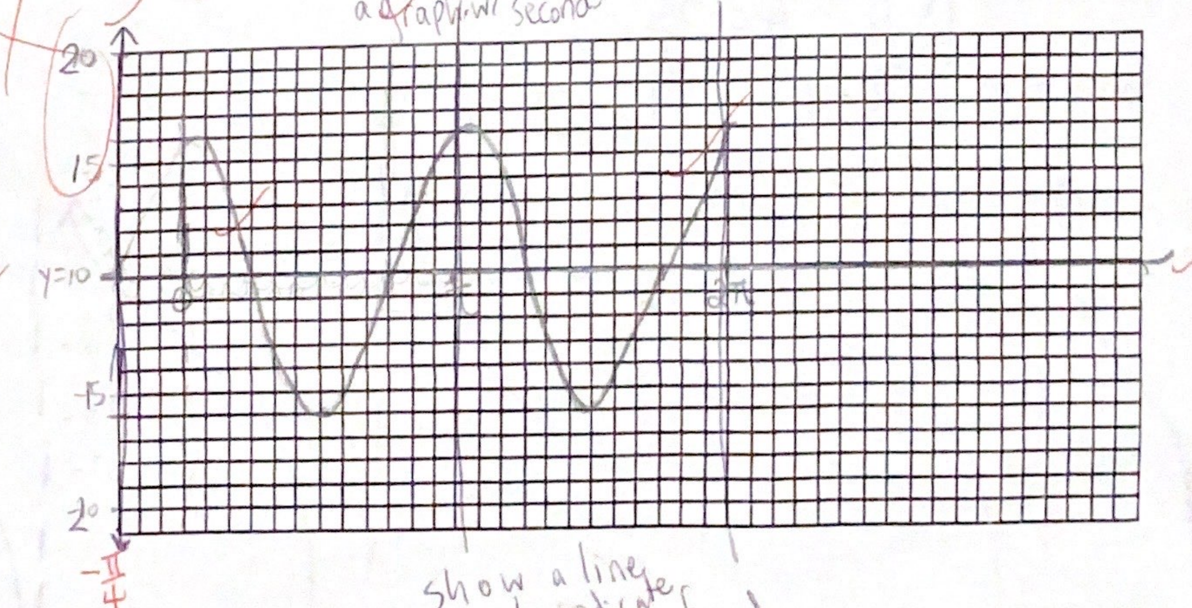
$$y = 6\sin 2\left(\theta + \frac{\pi}{4}\right) + 10$$

period = π

a=6

new y-axis ~~[illegible]~~ $= -\frac{\pi}{4}$ (moved left from y=0)

Know how to make a graph w/ seconds



show a line to indicate end of period

$\frac{12}{13}$