TERM 4 TEST

Tue 4 June 2019

1) a) $\left(\frac{(5^3)^2}{5(5^6)}\right)^{-1} = \left(\frac{5^6}{5^7}\right)^{-1} = \left(5^{6-7}\right)^{-1} = \left(5^{-1}\right)^{-1} = 5$

b) $\left(\frac{10^{-3}}{10^{-5}}\right)^2 = \left(10^{-3+5}\right)^2 = \left(10^2\right)^2 = 10^4 = 10000$

c) $4^{-2} + 3^{0} - 2^{-3} = \frac{1}{4^2} + 1 - \frac{1}{2^3} = \frac{1}{16} + 1 - \frac{1}{8} =$

$= \frac{1 + 16 - 2}{16} = \frac{15}{16}$

d) $\left(\frac{1}{4}\right)^3 = \left(\frac{1}{2^2}\right)^3 = \left(\left[\frac{1}{2}\right]^2\right)^3 = \left(\frac{1}{2}\right)^6 =$

$= \frac{1}{2^6}$

2) $A(t) = 100\left(\frac{1}{2}\right)^{\frac{t}{4.5 \cdot 10^9}}$

3) $H(n) = 5 \cdot (0.8)^n$

$H(0) = 5 \cdot (0.8)^0 = 5$ m

$H(1) = 5 \cdot (0.8)^1 = 4$ m

$H(2) = 5 \cdot (0.8)^2 = 3.2$ m

$H(4) = 5 \cdot (0.8)^4 = 2.05$ m

0.64
11

4) Bank interest 19.5% /a Compounded daily

$$A(n) = P(1+i)^n = 465(1+0.000534)^{15} =$$

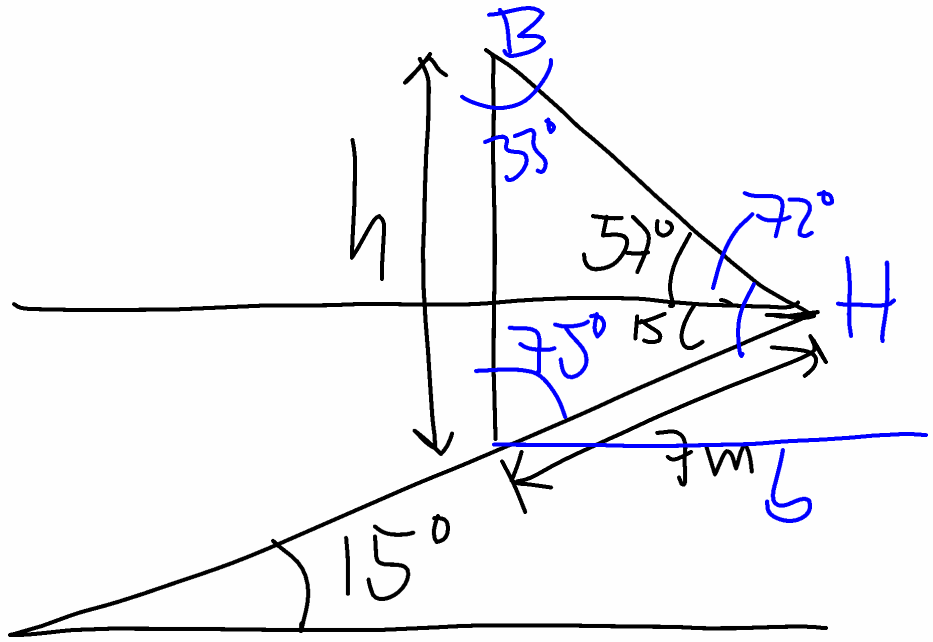
$$= 465 \cdot 1.008 \simeq \boxed{468.74}$$

$P = 465$

$n = 15$

$$i = \frac{19.5\%}{365} = 0.0534\% = 0.000534$$

5)



ASA

75° 7m 72°

$$\frac{h}{\sin H} = \frac{b}{\sin B}$$

$$\frac{h}{\sin 72^\circ} = \frac{7}{\sin 33} \Rightarrow \boxed{h = 7 \cdot \frac{\sin 72^\circ}{\sin 33^\circ} \simeq 12.22\,m}$$

6) $f(x) = \frac{1}{2} + \frac{5}{2}\cos(30x)$

a) $y_{max} = \frac{1}{2} + \frac{5}{2} = 3$

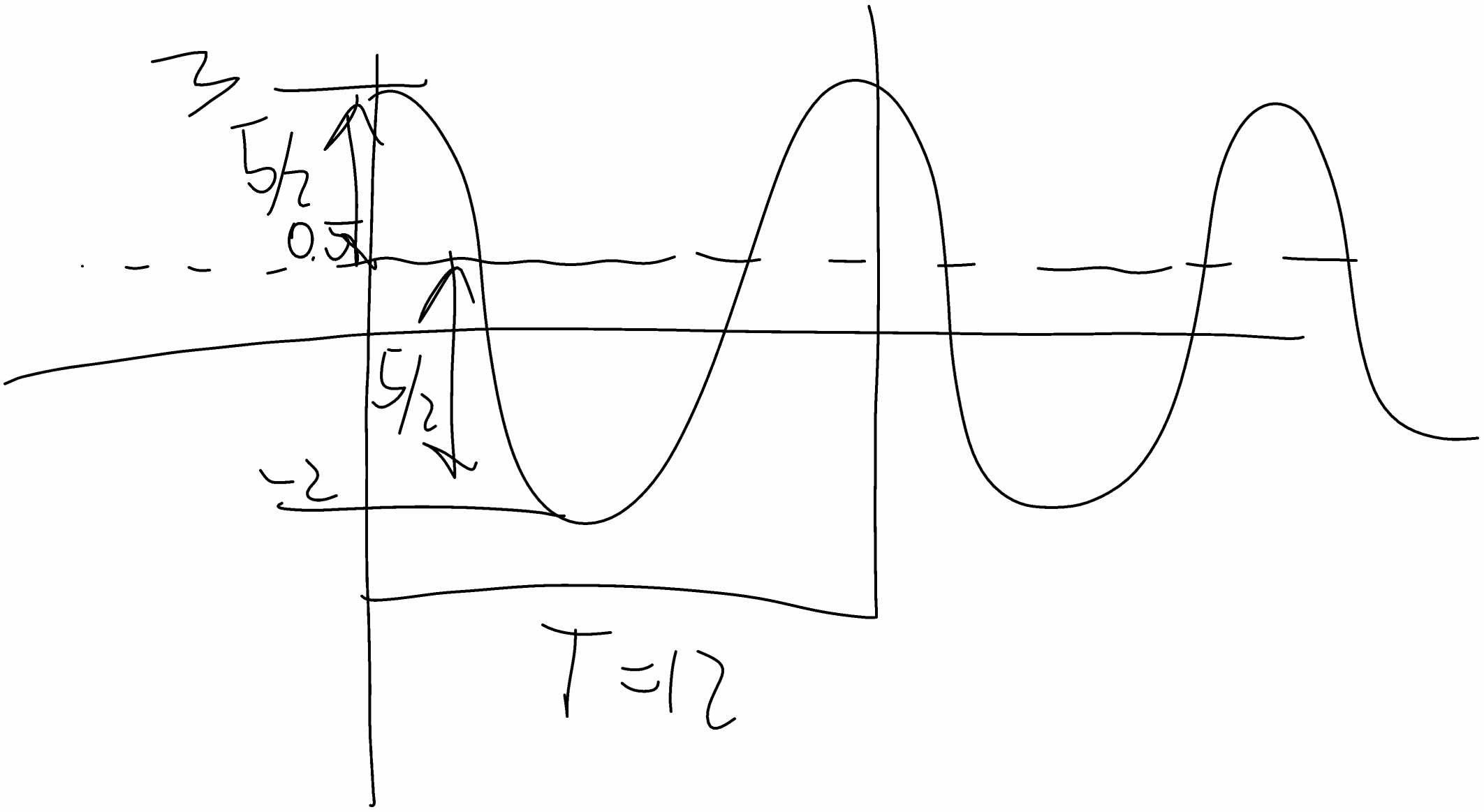
b) $y_{min} = \frac{1}{2} + \frac{5}{2}(-1) = -2$

c) $A = \frac{y_{max} - y_{min}}{2} = \frac{3-(-2)}{2} = \boxed{\frac{5}{2}}$

d) $y_{mid} = \frac{y_{max} + y_{min}}{2} = \frac{3-2}{2} = \boxed{\frac{1}{2}}$

e) $30T = 360$

$\boxed{T = 12}$


3
5/2
0.5
5/2
-2
T=12