高雄市明誠中學 高二數學平時測驗 日期：100.09.06					
範圍	1-1 銳角三角函數	班級	二年____班	姓名	
		座號			

一、填充題 (每題 10 分)

1.設 θ 為銳角，且 $\tan\theta=\dfrac{\sqrt{5}}{2}$，則 $\dfrac{\sin\theta}{1+\cos\theta}=$____________．

解答 $\dfrac{\sqrt{5}}{5}$

解析 因為 θ 為銳角，且 $\tan\theta=\dfrac{\sqrt{5}}{2}\Rightarrow r=\sqrt{2^2+(\sqrt{5})^2}=3$，所以 $\cos\theta=\dfrac{2}{3}$，$\sin\theta==\dfrac{\sqrt{5}}{3}$，

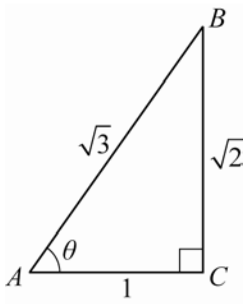
故 $\dfrac{\sin\theta}{1+\cos\theta}=\dfrac{\frac{\sqrt{5}}{3}}{1+\frac{2}{3}}=\dfrac{\sqrt{5}}{5}$．

2.設 θ 為銳角且 $\tan\theta=\sqrt{2}$，則：(1) $\sin\theta=$____________． (2) $\cos\theta=$____________．

解答 (1) $\dfrac{\sqrt{6}}{3}$;(2) $\dfrac{\sqrt{3}}{3}$

解析 如圖：$\tan\theta=\dfrac{\sqrt{2}}{1}\Rightarrow r=\sqrt{1^2+(\sqrt{2})^2}=\sqrt{3}$，

$\sin A=\dfrac{\overline{BC}}{\overline{AB}}=\dfrac{\sqrt{2}}{\sqrt{3}}=\dfrac{\sqrt{6}}{3}$，$\cos A=\dfrac{\overline{AC}}{\overline{AB}}=\dfrac{1}{\sqrt{3}}=\dfrac{\sqrt{3}}{3}$．



3.設四邊形 $ABCD$ 中，$\overline{AB}=3$，$\overline{BC}=2$，$\overline{CD}=1$，且 $\angle ABD=\angle BCD=90°$，則：

(1) $\sin A=$____________． (2) $\cos A=$____________．

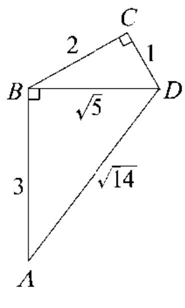
解答 (1) $\sin A=\dfrac{\sqrt{5}}{\sqrt{14}}$;(2) $\cos A=\dfrac{3}{\sqrt{14}}$

解析

如圖：四邊形 $ABCD$ 中，$\overline{AB}=3$，$\overline{BC}=2$，$\overline{CD}=1$，且

$\angle ABD=\angle BCD=90°$，故得 $\overline{BD}=\sqrt{5}$，$\overline{AD}=\sqrt{14}$，

由定義 $\sin A=\dfrac{\sqrt{5}}{\sqrt{14}}$，$\cos A=\dfrac{3}{\sqrt{14}}$．



4. $\dfrac{2\sin 60°\cos 30°-\sin^2 45°\tan^2 60°+\tan 45°}{\sin 30°\cos 60°-\cos^2 45°\tan^2 30°}$ 之值為____________．

解答 12

解析 原式 $=\dfrac{2\cdot\frac{\sqrt{3}}{2}\cdot\frac{\sqrt{3}}{2}-(\frac{\sqrt{2}}{2})^2\cdot(\sqrt{3})^2+1}{\frac{1}{2}\cdot\frac{1}{2}-(\frac{\sqrt{2}}{2})^2\cdot(\frac{\sqrt{3}}{3})^2}=\dfrac{1}{\frac{1}{4}-\frac{1}{6}}=12$．

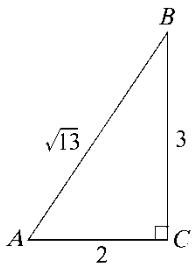
5.設函數 $f(x)=4\sin x$，$30°\le x\le 60°$，則 $f(x)$ 的範圍為____________．

解答 $2 \le f(x) \le 2\sqrt{3}$

解析 正弦函數在 $0° < x < 90°$是遞增函數，故當 $30° \le x \le 60°$時，我們可得

$\sin 30° \le \sin x \le \sin 60° \Rightarrow 4 \cdot \frac{1}{2} \le 4\sin x \le 4 \cdot \frac{\sqrt{3}}{2}$，所以 $2 \le f(x) \le 2\sqrt{3}$.

6.$\triangle ABC$ 中，$\angle C = 90°$，$\overline{AC} = 2$，$\overline{AB} = \sqrt{13}$，則：(1) $\sin B =$ ＿＿＿＿＿ .　(2) $\cos B =$ ＿＿＿＿＿ .



解答 (1)$\frac{2}{\sqrt{13}}$;(2)$\frac{3}{\sqrt{13}}$

解析 $\overline{BC} = \sqrt{(\sqrt{13})^2 - 2^2} = 3$，$\therefore \sin B = \frac{2}{\sqrt{13}}$，$\cos B = \frac{3}{\sqrt{13}}$.

7.$\sin 30° \cdot \cos 45° \cdot \tan 60° \cdot \cot 45° =$ ＿＿＿＿＿ .

解答 $\frac{\sqrt{6}}{4}$

解析 原式 $= \frac{1}{2} \cdot \frac{1}{\sqrt{2}} \cdot \sqrt{3} \cdot 1 = \frac{\sqrt{6}}{4}$.

8.$\cos^2 40° + \cos^2 50° + \cos^2 60° =$ ＿＿＿＿＿ .

解答 $\frac{5}{4}$

解析 原式 $= \cos^2 40° + \cos^2(90° - 40°) + \cos^2 60° = \cos^2 40° + \sin^2 40° + (\frac{1}{2})^2 = 1 + \frac{1}{4} = \frac{5}{4}$.

9.$\sin^2(45° + \theta) + \sin^2(45° - \theta) =$ ＿＿＿＿＿ .

解答 1

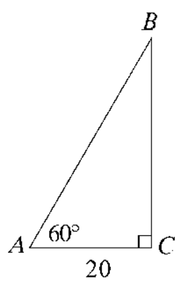
解析 原式 $= \sin^2(45° + \theta) + \sin^2(90° - (45° + \theta)) = \sin^2(45° + \theta) + \cos^2(45° + \theta) = 1$.

10.$\log_2 \sin 30° + \log_2 \cos 30° + \log_2 \tan 30° =$ ＿＿＿＿＿ .

解答 -2

解析 原式 $= \log_2(\sin 30° \cos 30° \tan 30°) = \log_2(\frac{1}{2} \cdot \frac{\sqrt{3}}{2} \cdot \frac{1}{\sqrt{3}}) = \log_2(\frac{1}{2})^2 = -2$.

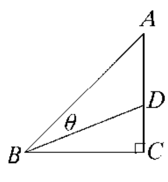
11.在直角$\triangle ABC$ 中，$\angle C = 90°$，$\angle A = 60°$，$\overline{AC} = 20$，求 $\overline{BC} =$ ＿＿＿＿＿ .



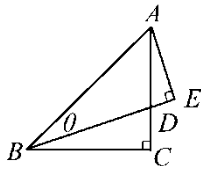
解答 $20\sqrt{3}$

解析 如圖，$\angle A = 60°$，則$\frac{\sqrt{3}}{1} = \frac{\overline{BC}}{20} \Rightarrow \overline{BC} = 20\sqrt{3}$.

12.如圖：$\overline{AC} = \overline{BC}$，$\overline{AD} : \overline{DC} = 3 : 2$，則 $\tan\theta =$ ＿＿＿＿＿ .



解答 $\frac{3}{7}$



解析 設 $\overline{AD}=3$，$\overline{DC}=2$，$\overline{BC}=5$，作 $\overline{AE}$ 垂直 $\overline{BD}$ 延長線於 E，
因$\triangle AED \sim \triangle BCD$，故 $\overline{AE}:\overline{DE}=\overline{BC}:\overline{CD}=5:2$，可設 $\overline{AE}=5t$，$\overline{DE}=2t$，

$$\overline{AD}=\sqrt{(5t)^2+(2t)^2}=\sqrt{29}t=3 \Rightarrow t=\frac{3}{\sqrt{29}} \Rightarrow \tan\theta=\frac{\overline{AE}}{\overline{BE}}=\frac{\frac{15}{\sqrt{29}}}{\sqrt{29}+\frac{6}{\sqrt{29}}}=\frac{15}{35}=\frac{3}{7}.$$

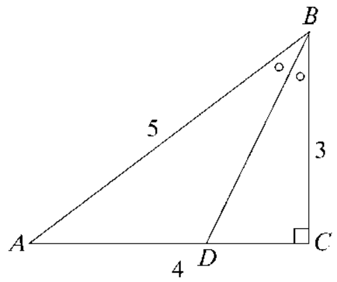
13.$\triangle ABC$ 中，$\overline{AB}=5$，$\overline{BC}=3$，$\overline{CA}=4$，$\angle B$ 的分角線交 $\overline{AC}$ 於 D，則：
(1) $\cos B=$ ____________ .　(2) $\tan\angle DBC=$ ____________ .

解答 (1)$\frac{3}{5}$;(2)$\frac{1}{2}$

解析 (1)$\triangle ABC$ 中，$\overline{BC}^2+\overline{CA}^2=9+16=25=\overline{AB}^2$，$\therefore \angle C=90° \Rightarrow \cos B=\frac{\overline{BC}}{\overline{AB}}=\frac{3}{5}$.

(2)$\because$ $\overline{BD}$ 爲 $\angle B$ 之分角線，$\therefore$ $\overline{AD}:\overline{DC}=\overline{AB}:\overline{BC}=5:3 \Rightarrow \overline{CD}=4\times\frac{3}{8}=\frac{3}{2}$，

故 $\tan\angle DBC=\frac{\overline{CD}}{\overline{BC}}=\frac{\frac{3}{2}}{3}=\frac{1}{2}$.



14.設 $0°<\theta<90°$且 $3\sin\theta+\cos\theta=2$，則 $\sin\theta+\cos\theta=$ ____________ .

解答 $\frac{4+\sqrt{6}}{5}$

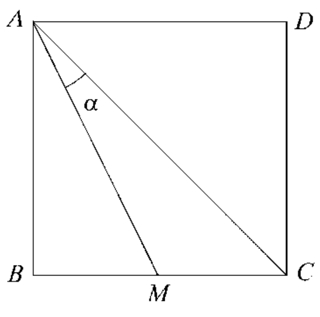
解析 $3\sin\theta+\cos\theta=2 \Rightarrow \cos\theta=2-3\sin\theta$代入 $\sin^2\theta+\cos^2\theta=1$

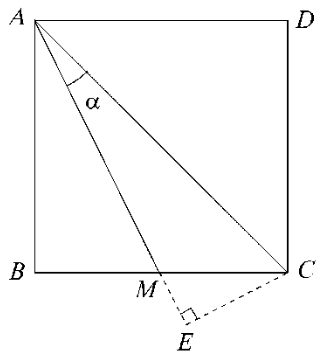
$\Rightarrow 10\sin^2\theta-12\sin\theta+3=0 \Rightarrow \sin\theta=\frac{6\pm\sqrt{6}}{10}$，

$\therefore \cos\theta=2-3\sin\theta=\frac{2\mp3\sqrt{6}}{10}$（其中$\frac{2-3\sqrt{6}}{10}<0$不合），

$\therefore \sin\theta+\cos\theta=\frac{6-\sqrt{6}}{10}+\frac{2+3\sqrt{6}}{10}=\frac{4+\sqrt{6}}{5}$.

15.如圖，正方形 $ABCD$ 中，M 爲 $\overline{BC}$ 中點，$\angle MAC=\alpha$，則 $\tan\alpha=$ ____________ .





解答 $\frac{1}{3}$

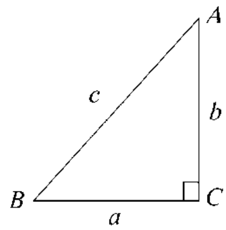
解析 過 C 作 $\overline{CE}$ 垂直 $\overline{AM}$ 的延長線於點 E，設正方形邊長為 a，由相似性質知 $\triangle ABM \sim \triangle CEM$，

$$\therefore \frac{\overline{CE}}{\overline{AB}}=\frac{\overline{EM}}{\overline{BM}}=\frac{\overline{CM}}{\overline{AM}}，故 \frac{\overline{CE}}{a}=\frac{\overline{EM}}{\frac{1}{2}a}=\frac{\frac{1}{2}a}{\frac{\sqrt{5}}{2}a}，即 \overline{CE}=\frac{a}{\sqrt{5}}，\overline{EM}=\frac{a}{2\sqrt{5}}，$$

在 $\triangle AEC$ 中，$\because \angle AEC=90°$，故 $\tan\alpha=\frac{\overline{CE}}{\overline{AE}}=\frac{\frac{a}{\sqrt{5}}}{\frac{\sqrt{5}a}{2}+\frac{a}{2\sqrt{5}}}=\frac{1}{3}$．

16.直角 $\triangle ABC$ 中，$\overline{AB}=c$，$\overline{BC}=a$，$\overline{CA}=b$，$\angle C=90°$，若 $\frac{3}{5}\cos A+\cos B=1$，則 $a：b：c=$ ____________．

解答 8：15：17



解析 原式 $\Rightarrow \frac{3}{5}\cdot\frac{b}{c}+\frac{a}{c}=1 \Rightarrow 3b+5a=5c \Rightarrow 3b=5c-5a$，

又 $a^2+b^2=c^2 \Rightarrow 9a^2+25(c-a)^2=9c^2 \Rightarrow 34a^2-50ca+16c^2=0$

$\Rightarrow 17a^2-25ca+8c^2=0$

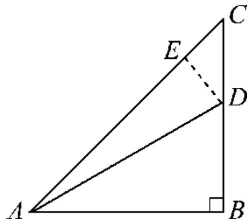
$\Rightarrow (17a-8c)(a-c)=0 \ \Rightarrow a=\frac{8}{17}c$ 或 c（不合），

$\therefore 3b=\frac{-40c}{17}+5c=\frac{45c}{17} \Rightarrow b=\frac{15}{17}c$，$\therefore a：b：c=\frac{8c}{17}：\frac{15c}{17}：c=8：15：17$．

17.設等腰 $\triangle ABC$ 中，$\angle B=90°$，若 D 是 $\overline{BC}$ 的中點，則：

(1)$\tan\angle BAD=$ ____________．　(2)$\tan\angle CAD=$ ____________．

解答 (1)$\frac{1}{2}$;(2)$\frac{1}{3}$



解析 如圖：在 $\triangle ABC$ 中，設 $\overline{AB}=\overline{BC}=2\sqrt{2}$，又 $\angle B=90°$，$\overline{AC}=\sqrt{2}\,\overline{BC}=4$，

過 D 作 $\overline{DE}\perp\overline{AC}$，垂足為 E，已知 D 為 $\overline{BC}$ 中點，

故知 $\overline{DE}=\overline{EC}=\frac{\sqrt{2}}{2}\overline{CD}=\frac{\sqrt{2}}{2}\cdot\sqrt{2}=1$，$\overline{AE}=\overline{AC}-\overline{EC}=4-1=3$，

$\tan\angle BAD=\frac{\overline{BD}}{\overline{AB}}=\frac{\sqrt{2}}{2\sqrt{2}}=\frac{1}{2}$，$\tan\angle CAD=\frac{\overline{DE}}{\overline{AE}}=\frac{1}{3}$．

18.$4\cos^2 30°+2\sin^2 45°+\tan^2 45°+\tan^2 60°+4\cos^2 60°+4\sin^2 60°=$ ____________．

解答 12

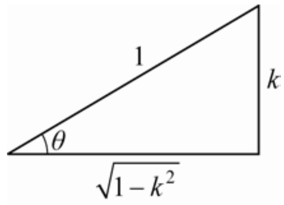
解析 原式 $=4(\frac{\sqrt{3}}{2})^2+2(\frac{\sqrt{2}}{2})^2+1^2+(\sqrt{3})^2+4(\frac{1}{2})^2+4(\frac{\sqrt{3}}{2})^2=3+1+1+3+1+3=12$．

19.設 θ 是一個銳角，$\sin\theta = k$，以 k 表出：

(1) $\tan\theta =$____________ ． (2) $\cos\theta =$____________ ．

解答 (1) $\dfrac{k}{\sqrt{1-k^2}}$;(2) $\sqrt{1-k^2}$

解析 $\sin\theta = k = \dfrac{k}{1}$，作圖，則 $\tan\theta = \dfrac{k}{\sqrt{1-k^2}}$，$\cos\theta = \sqrt{1-k^2}$ ．



20.設 $\sin\theta + \cos\theta = \dfrac{5}{4}$，求 $\sin\theta \cdot \cos\theta =$____________ ．

解答 $\dfrac{9}{32}$

解析 $(\sin\theta + \cos\theta)^2 = (\dfrac{5}{4})^2 \Rightarrow (\sin^2\theta + \cos^2\theta) + 2\sin\theta\cos\theta = \dfrac{25}{16}$

$\Rightarrow 1 + 2\sin\theta\cos\theta = \dfrac{25}{16} \Rightarrow \sin\theta\cos\theta = \dfrac{9}{32}$ ．

21.設 θ 爲銳角，若 $\sin\theta\cos\theta = \dfrac{1}{4}$，則 $\sin\theta - \cos\theta$ 之值爲____________ ．

解答 $\pm\dfrac{\sqrt{2}}{2}$

解析 $\because (\sin\theta - \cos\theta)^2 = \sin^2\theta - 2\sin\theta\cos\theta + \cos^2\theta = 1 - 2\sin\theta\cos\theta = 1 - 2 \times \dfrac{1}{4} = \dfrac{1}{2}$,

$\therefore \sin\theta - \cos\theta = \pm\dfrac{1}{\sqrt{2}} = \pm\dfrac{\sqrt{2}}{2}$ ．

22.設 θ 爲銳角，$\sin\theta - \cos\theta = \dfrac{1}{5}$，求 $\sin\theta =$____________ ．

解答 $\dfrac{4}{5}$

解析 $\sin\theta - \cos\theta = \dfrac{1}{5} \Rightarrow (\sin\theta - \cos\theta)^2 = (\dfrac{1}{5})^2 \Rightarrow \sin^2\theta - 2\sin\theta\cos\theta + \cos^2\theta = \dfrac{1}{25}$,

$\Rightarrow 1 - 2\sin\theta\cos\theta = \dfrac{1}{25} \Rightarrow \sin\theta\cos\theta = \dfrac{12}{25}$,

$(\sin\theta + \cos\theta)^2 = \sin^2\theta + 2\sin\theta\cos\theta + \cos^2\theta = 1 + 2 \times \dfrac{12}{25} = \dfrac{49}{25}$,

又 θ 爲一銳角，故 $\sin\theta + \cos\theta = \dfrac{7}{5}$，$\begin{cases} \sin\theta - \cos\theta = \dfrac{1}{5} \cdots\cdots① \\ \sin\theta + \cos\theta = \dfrac{7}{5} \cdots\cdots② \end{cases}$，

由① + ②得 $2\sin\theta = \dfrac{8}{5}$，故 $\sin\theta = \dfrac{4}{5}$ ．

23.設 $0° < x < 45°$且 $\sin x + \cos x = \dfrac{4}{3}$，則：

(1)$\sin x \cdot \cos x =$ ____________． (2)$\sin x - \cos x =$ ____________．(3) $\tan\theta + \cot\theta =$____________．

解答 (1)$\dfrac{7}{18}$;(2)$-\dfrac{\sqrt{2}}{3}$;(3) $\dfrac{18}{7}$

解析 (1) $\sin x + \cos x = \dfrac{4}{3}$平方之，得 $1 + 2\sin x\cos x = \dfrac{16}{9}$，$\therefore 2\sin x\cos x = \dfrac{7}{9}$，即 $\sin x\cos x = \dfrac{7}{18}$．

(2)因爲 $0° < x < 45°$，故 $0 < \sin x < \cos x$，

又$(\sin x - \cos x)^2 = 1 - 2\sin x\cos x = 1 - \dfrac{7}{9} = \dfrac{2}{9}$，得 $\sin x - \cos x = -\dfrac{\sqrt{2}}{3}$．

(3) $\tan\theta + \cot\theta = \dfrac{1}{\sin\theta\cos\theta} = \dfrac{18}{7}$

24.求 $\cos^2 10° + \cos^2 20° + \cos^2 30° + \cos^2 40° + \cos^2 50° + \cos^2 60° + \cos^2 70° + \cos^2 80°$ 的值 = __________．

解答 4

解析 原式 $= (\cos^2 10° + \cos^2 80°) + (\cos^2 20° + \cos^2 70°) + (\cos^2 30° + \cos^2 60°) + (\cos^2 40° + \cos^2 50°)$

$= (\sin^2 80° + \cos^2 80°) + (\sin^2 70° + \cos^2 70°) + (\sin^2 60° + \cos^2 60°) + (\sin^2 50° + \cos^2 50°)$

$= 1 + 1 + 1 + 1 = 4$．

25.設 θ，ϕ 爲銳角，若 $\theta + \phi = 90°$，則 $\sin\theta\cos\phi + \cos\theta\sin\phi =$ ____________．

解答 1

解析 $\because \theta + \phi = 90°$，$\therefore \phi = 90° - \theta$，故 $\sin\theta\cos\phi + \cos\theta\sin\phi$

$= \sin\theta\cos(90° - \theta) + \cos\theta\sin(90° - \theta)$

$= \sin\theta\sin\theta + \cos\theta\cos\theta$

$= \sin^2\theta + \cos^2\theta = 1$．

26.$\log_8\sqrt{2 + \tan 60°} + \log_8\sqrt{1 - \cos 30°} =$ ____________．

解答 $-\dfrac{1}{6}$

解析 原式 $= \log_8\sqrt{2 + \sqrt{3}} + \log_8\sqrt{1 - \dfrac{\sqrt{3}}{2}} = \log_8\sqrt{2 + \sqrt{3}} + \log_8\sqrt{\dfrac{2 - \sqrt{3}}{2}}$

$= \log_8\sqrt{(2 + \sqrt{3})(\dfrac{2 - \sqrt{3}}{2})} = \log_8\sqrt{\dfrac{1}{2}} == \log_{2^3} 2^{-\frac{1}{2}} = \dfrac{-\frac{1}{2}}{3}\log_2 2 = -\dfrac{1}{6}$．

27.設 $f(n) = \sin^n\theta + \cos^n\theta$，$n \in \boldsymbol{N}$，則 $2f(6) - 3f(4) + 2f(2) =$ ____________．

解答 1

解析 參考公式：$a^2 + b^2 = (a + b)^2 - 2ab$；$a^3 + b^3 = (a + b)^3 - 3ab(a + b)$

$f(6) = \sin^6\theta + \cos^6\theta = (\sin^2\theta + \cos^2\theta)^3 - 3\sin^2\theta\cos^2\theta(\sin^2\theta + \cos^2\theta) = 1 - 3\sin^2\theta\cos^2\theta$,

$f(4) = \sin^4\theta + \cos^4\theta = (\sin^2\theta + \cos^2\theta)^2 - 2\sin^2\theta\cos^2\theta = 1 - 2\sin^2\theta\cos^2\theta$,

$f(2) = \sin^2\theta + \cos^2\theta = 1$,

$\therefore 2f(6) - 3f(4) + 2f(2) = 2 - 6\sin^2\theta\cos^2\theta - 3 + 6\sin^2\theta\cos^2\theta + 2 = 1$．

28.θ 為銳角，若 $\sin\theta-\cos\theta=\dfrac{1}{2}$，則：

(1) $\sin^4\theta+\cos^4\theta=$______________． (2) $\tan^2\theta+\dfrac{1}{\tan^2\theta}=$______________．

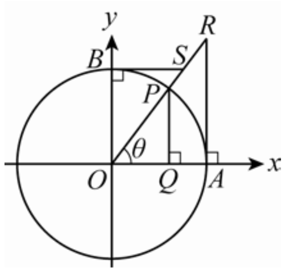
解答 (1) $\dfrac{23}{32}$;(2) $\dfrac{46}{9}$

解析 $\sin\theta-\cos\theta=\dfrac{1}{2}$ 平方之 $\Rightarrow 1-2\sin\theta\cos\theta=\dfrac{1}{4}\Rightarrow\sin\theta\cos\theta=\dfrac{3}{8}$．

(1) $\sin^4\theta+\cos^4\theta=(\sin^2\theta+\cos^2\theta)^2-2\sin^2\theta\cos^2\theta=1-2\cdot\dfrac{9}{64}=\dfrac{23}{32}$．

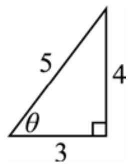
(2) $\tan^2\theta+\dfrac{1}{\tan^2\theta}=\dfrac{\sin^2\theta}{\cos^2\theta}+\dfrac{\cos^2\theta}{\sin^2\theta}=\dfrac{\sin^4\theta+\cos^4\theta}{\sin^2\theta\cos^2\theta}=\dfrac{\frac{23}{32}}{\frac{9}{64}}=\dfrac{46}{9}$．

29.設 $A(1,\ 0)$，$B(0,\ 1)$ 及 P 皆在單位圓上（如圖），且 $\angle POA$ 為銳角，過 P 作 $\overline{OA}$ 的垂線，而交 $\overline{OA}$ 於 Q，延長 $\overline{OP}$ 而交過 A 的切線於 R，交過 B 的切線於 S，若 $\overline{BS}=\dfrac{3}{4}$，則 $\triangle OPQ$ 的周長＝______________．



解答 $\dfrac{12}{5}$

解析 $\angle OSB=\theta\Rightarrow\tan\theta=\dfrac{\overline{OB}}{\overline{BS}}$，即 $\tan\theta=\dfrac{1}{\frac{3}{4}}=\dfrac{4}{3}$，



$\cos\theta=\dfrac{\overline{OQ}}{\overline{OP}}\Rightarrow\overline{OQ}=\overline{OP}\cdot\cos\theta=1\cdot\dfrac{3}{5}=\dfrac{3}{5}$，

$\sin\theta=\dfrac{\overline{PQ}}{\overline{OP}}\Rightarrow\overline{PQ}=\overline{OP}\cdot\sin\theta=1\cdot\dfrac{4}{5}=\dfrac{4}{5}$，

$\triangle OPQ$ 的周長 $=\dfrac{3}{5}+\dfrac{4}{5}+1=\dfrac{12}{5}$．

30.若 $\tan\theta=\cos\theta$，θ 為銳角，求 $\dfrac{1}{1-\sin\theta}+\dfrac{1}{1+\sin\theta}=$______________．

解答 $1+\sqrt{5}$

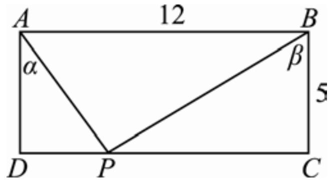
解析 $\tan\theta=\cos\theta$，$\therefore\dfrac{\sin\theta}{\cos\theta}=\cos\theta$，$\therefore\sin\theta=\cos^2\theta=1-\sin^2\theta\Rightarrow\sin^2\theta+\sin\theta-1=0$，

$\therefore\sin\theta=\dfrac{-1\pm\sqrt{5}}{2}$（負不合），

通分，

求值式 $=\dfrac{(1+\sin\theta)+(1-\sin\theta)}{(1-\sin\theta)(1+\sin\theta)}=\dfrac{2}{1-\sin^2\theta}=\dfrac{2}{\cos^2\theta}=\dfrac{2}{\sin\theta}=\dfrac{2}{\frac{-1+\sqrt{5}}{2}}=\dfrac{4}{\sqrt{5}-1}=\sqrt{5}+1$．

31.如圖，矩形 $ABCD$ 中，$\overline{AB}=12$，$\overline{BC}=5$，若 P 為 $\overline{CD}$ 上一點，$\angle PAD=\alpha$，$\angle PBC=\beta$，則 $\tan\alpha+\tan\beta=$________ .



解答 $\dfrac{12}{5}$

解析 $\tan\alpha+\tan\beta=\dfrac{\overline{DP}}{\overline{AD}}+\dfrac{\overline{CP}}{\overline{BC}}=\dfrac{\overline{DP}}{\overline{BC}}+\dfrac{\overline{CP}}{\overline{BC}}=\dfrac{\overline{DP}+\overline{CP}}{\overline{BC}}=\dfrac{\overline{AB}}{\overline{BC}}=\dfrac{12}{5}$.