

F.TF.C.8: Proving Trigonometric Identities 1

1 Which expression always equals 1?

- | | |
|--------------------------|----------------------|
| 1) $\cos^2 x - \sin^2 x$ | 3) $\cos x - \sin x$ |
| 2) $\cos^2 x + \sin^2 x$ | 4) $\cos x + \sin x$ |

2 If $\sin^2(32^\circ) + \cos^2(M) = 1$, then M equals

- | | |
|---------------|---------------|
| 1) 32° | 3) 68° |
| 2) 58° | 4) 72° |

3 The expression $\cos^2 4\theta + \sin^2 4\theta$ is equivalent to

- | | |
|------|-------------------|
| 1) 1 | 3) $\cos \theta$ |
| 2) 2 | 4) $\cos 8\theta$ |

4 The expression $\sin^2 x + \cos^2 x - b^2$ is equivalent to

- | | |
|----------|------------------------|
| 1) 1 | 3) $(1+b)(1-b)$ |
| 2) b^2 | 4) $\sin x \cos x - b$ |

5 If θ is a positive acute angle and $\sin \theta = a$, which expression represents $\cos \theta$ in terms of a ?

- | | |
|-------------------|-----------------------------|
| 1) \sqrt{a} | 3) $\frac{1}{\sqrt{a}}$ |
| 2) $\sqrt{1-a^2}$ | 4) $\frac{1}{\sqrt{1-a^2}}$ |

6 Starting with $\sin^2 A + \cos^2 A = 1$, derive the formula $\tan^2 A + 1 = \sec^2 A$.

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Answer Section

1 ANS: 2 REF: 011208a2

2 ANS: 1 REF: 011704aii

3 ANS: 1

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

REF: 060812b

4 ANS: 3 REF: 060121siii

5 ANS: 2

$$\cos^2 \theta + \sin^2 \theta = 1$$

$$\cos^2 \theta = 1 - \sin^2 \theta$$

$$\sqrt{\cos^2 \theta} = \sqrt{1 - \sin^2 \theta}$$

$$\cos \theta = \sqrt{1 - \sin^2 \theta}$$

REF: 060418b

6 ANS:

$$\frac{\sin^2 A}{\cos^2 A} + \frac{\cos^2 A}{\cos^2 A} = \frac{1}{\cos^2 A}$$

$$\tan^2 A + 1 = \sec^2 A$$

REF: 011135a2