Determining Exact Trig Ratios Homework

1. Each point lies on the terminal arm of angle θ in standard position.
   i) Draw a sketch of each angle θ.
   ii) Determine the value of r to the nearest tenth.
   iii) Determine the primary trigonometric ratios for angle θ.
   iv) Calculate the value of θ to the nearest degree.

   a) $(5, 11)$ **b)** $(-8, 3)$ **c)** $(-5, -8)$ **d)** $(6, -8)$

2. Angle θ is a principal angle that lies in quadrant 2 such that $0° \leq \theta \leq 360°$
   Given each trigonometric ratio,
   i) determine the exact values of x, y, and r
   ii) sketch angle θ in standard position
   iii) determine the principal angle θ and the related acute angle β to the nearest degree

   a) $\sin\theta = \frac{1}{3}$
   b) $\cot\theta = -\frac{4}{3}$
   c) $\cos\theta = -\frac{1}{4}$
   d) $\csc\theta = 2.5$
   e) $\tan\theta = -1.1$
   f) $\sec\theta = -3.5$

3. Given $\cos\theta = -\frac{5}{12}$, where $0° \leq \theta \leq 360°$,
   a) in which quadrant could the terminal arm of θ lie?
   b) determine all possible primary trigonometric ratios for θ.
   c) evaluate all possible values of θ to the nearest degree.

4. Determine the exact value of each trigonometric expression.
   a) $\sin 30° \times \tan 60° - \cos 30°$
   b) $2\cos 45° \times \sin 45°$
   c) $\tan^2 30° - \cos^2 45°$
   d) $1 - \frac{\sin 45°}{\cos 45°}$

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5. Show that $\tan 30° + \frac{1}{\tan 30°} = \frac{1}{\sin 30° \cos 30°}$.

6. To claim a prize in a contest, the following skill-testing question was asked:
   Calculate $\sin 45°(1 - \cos 30°) + 5\tan 60°(\sin 60° - \tan 30°)$.
   Give answer in exact radical form.

7. Using exact values, show that $\frac{\sin\theta}{\cos\theta} = \tan\theta$ for each angle.
   a) $\theta = 30°$ **b)** $\theta = 45°$ **c)** $\theta = 60°$