1. (5 points each) In a right triangle, \( \sin \theta = \frac{3}{4} \) sketch the triangle and evaluate \( \cos \theta \) and \( \tan \theta \). Show your work. Do not use a calculator.

   (a) Solutions: The shortest leg of that triangle is equal to \( \sqrt{4^2 - 3^2} = \sqrt{7} \) so \( \cos \theta = \frac{\sqrt{7}}{4} \) and \( \tan \theta = \frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7} \).

2. (5 points each) In a right triangle, \( \tan \theta = 4 \). Sketch the triangle and evaluate \( \sin \theta \) and \( \csc \theta \). Show your work. Do not use a calculator.

   (a) Solution: The longest leg of the triangle is equal to \( \sqrt{4^2 + 1^2} = \sqrt{17} \) so \( \sin \theta = \frac{4}{\sqrt{17}} = 17 \) and \( \csc \theta = \frac{\sqrt{17}}{4} \).

3. (5 points each) \( \sin \theta = -\frac{2}{5} \), \( \theta \) is located in the third quadrant. Based on the information provided find the exact value of \( \cos \theta \).

   (a) Solution: \( \cos \theta = \pm \sqrt{1 - \sin^2 \theta} = \pm \sqrt{1 - \left(-\frac{2}{5}\right)^2} = -\sqrt{\frac{25 - 4}{25}} = -\frac{\sqrt{21}}{5} \).

4. 5 points) A plane rises from take-off and flies at an angle of 9°. When it has gained 750 feet, find the distance to the nearest foot, the plane has flown.

   Solution (compare Ex. 57 on page 486):
   \[ \sin 9° = \frac{750}{d} \] so \( d = \frac{750}{\sin 9°} \approx 4794 \) feet.

5. Find two values of \( \theta \) such that \( \cos \theta = 0.5 \), write your answer in degrees.

   Answer: \( \theta = 60° \), or \( \theta = -60° \) (there are many other solutions)