Routine Angles and Shapes Practice #3

1. 
   Angle \( a \) = ............................................
   Reasons = ............................................
                 ............................................
   Angle \( b \) = ..............................
   Reason = ..............................

2. 
   Angle \( \angle OZY \) = 62°
   Angle \( \angle YXO\) = ..............................
   Reasons = ............................................
                 ............................................

3. 
   Calculate the interior angles of a regular pentagon. Explain your steps.

   .............................................
                 .............................................

4. 
   The interior reflex angles of the regular star are all 252°.
   Give the size of the interior acute angles = ..............................
Answers: Routine Angles and Shapes Practice #3

1.

Angle $a = 70^\circ$ (not 66, those lines aren’t parallel)

Reasons = Alternate angles on parallel lines are equal
Angles on a straight line add up to 180°
(or, corresponding angles are equal, then on line)
(or, cointerior add to 180°, then vertically opposite)

Angle $b = 114^\circ$

Reason = Co-interior angles on parallel lines add up to 180°

2.

Angle $\angle OZY = 62^\circ$

Angle $\angle YXO = 28^\circ$

Reasons = Angle XYZ is 90° (formed from ends of a diameter)

$180^\circ - 90^\circ - 62^\circ = 28^\circ$ (interior angles in a triangle = 180°)

(line OY can be ignored)

3.

Calculate the interior angles of a regular pentagon. Show your steps.

**Sum of angles in a pentagon = 3 × 180 = 540°**

$540 \div 5 = 108^\circ$ (since all angles are equal in regular pentagon)

4.

The interior reflex angles of the regular star are all 252°.

Give the size of the interior acute angles = 36°

**Opposite side of reflex angle is 108° (360 – 252)**

Triangle formed from star tips is isosceles, so small angles are = 36°

Two small angles + point = 108° (interior angle of pentagon)

$=>$ angle at point = 36°

Or via internal angles of decagon add to $8 \times 180^\circ = 1440^\circ = 5 \times 252^\circ + 5 \times \alpha$