4 **(a) (i)** Write the binary number 10101 as a decimal number.

$$32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1$$
$$1 \quad 0 \quad 1 \quad 0 \quad 1$$

Answer _____ 21 _____ [1]

(ii) Write the decimal number 26 as a binary number.

$$32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1$$
$$1 \quad 1 \quad 0 \quad 1 \quad 0$$

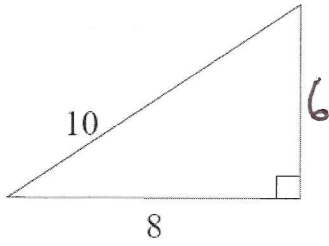Answer _____ 11010 _____ [1]

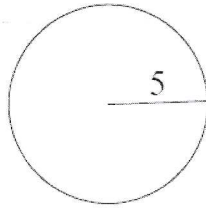**(b)** Find the value of $3^0 + 4^0$

$$1 + 1$$

Answer _____ 2 _____ [1]

$$(anything)^0 = 1$$

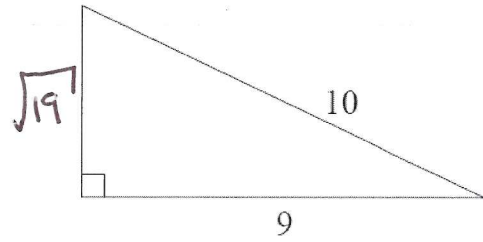**10** For each shape, decide whether the area is a rational or an irrational number. Give a reason for each answer.

Shape A

10 6 8

Shape B

5 $\sqrt{19}$

Shape C

$\sqrt{19}$ 10 9

Area $= 6 \times 8 \div 2$
$= 24$

$A = \pi \times 5^2$
$A = 25\pi$

Area $= \frac{1}{2} \times 9 \times \sqrt{19}$
$= 4.5 \times \sqrt{19}$

Area of Shape A is ___Rational___ because $24 = \frac{24}{1}$

_____ [1]

Area of Shape B is ___25π___ because ___π is irrational___
so $25 \times \pi$ must also be irrational [1]

Area of Shape C is ___$\frac{9}{2} \times \sqrt{19}$___ because ___$\sqrt{19}$ is irrational___

_____ [1]