

⑤ let a be any positive integer and $b = 3$
By using euclids div. algo.

$$a = 3q + r, \text{ where } q, r \text{ are integers}$$
$$0 \leq r < 3$$

Possible values of r are 0, 1, 2,

if $r = 0$

$$a = 3q$$

Cubing both sides

$$a^3 = 27q^3$$
$$= 9(3q^3)$$
$$= 9m$$

where m
is some
integer

$r = 1$

$$a = 3q + 1$$

$$a^3 = (3q + 1)^3$$
$$= 27q^3 + 27q^2 + 9q + 1$$
$$= 9(3q^3 + 3q^2 + q) + 1$$
$$= 9m + 1$$


$r = 2$

$$a = 3q + 2$$

$$a^3 = (3q + 2)^3$$
$$= 27q^3 + 54q^2 + 36q + 8$$
$$= 9(3q^3 + 6q^2 + 4q) + 8$$
$$= 9m + 8$$

\therefore cube of any positive integer is of
the form $9m, 9m + 1$ or $9m + 8$

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