Let's carefully analyze the problem and see what we can determine.

Given:

- \(p \) is a prime number **greater than 2**.

- \(r, h \) are integers.

- The expression \(\frac{(r+h)^p}{2r + h} \) is an **integer**.

  (In other words, \(2r + h \) divides \((r+h)^p \).)

Question:

Does \(2r + h \) **divide** \(-r^p \)?

Step 1: Understand what is given

- The key is that \(\frac{(r+h)^p}{2r + h} \) is an integer.

- So, \(2r + h \mid (r+h)^p \).

Step 2: Consider the divisibility

Since \(2r + h \) divides \((r+h)^p \), and \(r+h \) is involved, perhaps it's helpful to relate \(2r + h \) to \(r+h \).

Express \(2r + h \) in terms of \(r+h \):

\[

2r + h = 2r + h

\]

But note that:

\[

r + h = (r) + h

\]

Step 3: Find a relation between \(2r + h \) and \(r+h \)

Suppose we look at the difference:

\[

(2r + h) - 2(r + h) = 2r + h - 2r - 2h = -h

\]

So,

\[

(2r + h) = 2(r + h) - h

\]

But perhaps more directly, think about the divisibility:

\[

2r + h \mid (r+h)^p

\]

Step 4: Test with some concrete values

To understand whether \(2r + h \) divides \(-r^p\), try specific examples satisfying the initial condition.

Example 1:

Let \(r=1, h=1 \):

- \(2r + h = 2(1) + 1 = 3 \)
- \(r+h = 1+1=2 \)

Check:

\[
\frac{(r+h)^p}{2r+h} = \frac{2^p}{3}
\]

For this to be an integer, \(3 \mid 2^p \). But \(2^p \) is a power of 2, and 3 does not divide any power of 2, unless \(p=0 \), which isn't prime.

So, **not** valid for this example.

Example 2:

Let \(r=2, h=2 \):

- $2r + h = 4 + 2 = 6$
- $r+h=4$

Check:

$$
\frac{4^p}{6}
$$

For this to be integer, $6 \mid 4^p$. But 4's prime factorization is 2^2, so $4^p=2^{2p}$. For $6=2 \times 3$ to divide 2^{2p}, 3 must divide 2^{2p}, which it does not. So, again, not valid unless $p=0$.

Example 3:

Choose $r=0$:

- $r=0$, $h=1$

Then:

- $2r+h = 0+1=1$
- $r+h=1$

Check:

$$
\frac{1^p}{1} =1
$$

which is integer, satisfying the condition.

Now, check whether $2r+h=1$ divides $-r^p=0$:

$$
1 \mid 0
$$

Yes, 1 divides 0.

Step 5: General reasoning

From the above, it seems that the divisibility condition depends heavily on the specific values of r and h. Let's analyze more systematically.

Key observations:

- Since $(r+h)^p$ is divisible by $2r+h$, and p is prime greater than 2, perhaps **Fermat's Little Theorem** or properties of prime exponents can help.

Step 6: Use properties of primes and divisibility

Recall **Fermat's Little Theorem**:

$$
a^p \equiv a \pmod{p}
$$

for prime p and integer a not divisible by p.

Suppose $2r + h = d$.

Given that $d \mid (r+h)^p$, then:

$$
(r+h)^p \equiv 0 \pmod{d}
$$

meaning d divides $(r+h)^p$.

Step 7: Express r in terms of d

Suppose $r \equiv x \pmod{d}$, and $h \equiv y \pmod{d}$.

Then,

$$
2r + h \equiv 0 \pmod{d} \Rightarrow 2x + y \equiv 0 \pmod{d}
$$

and

$$
r+h \equiv x + y \pmod{d}
$$

Since $d \mid (r+h)^p$, then

$$
(x + y)^p \equiv 0 \pmod{d}
$$

which implies

$$
x + y \equiv 0 \pmod{d}
$$

because p is prime and d divides $(x + y)^p$, so $d \mid x + y$.

Now, from earlier:

$$
2x + y \equiv 0 \pmod{d}
$$

and

$$
x + y \equiv 0 \pmod{d}
$$

Subtract these two:

$$
(2x + y) - (x + y) = x \equiv 0 \pmod{d}
$$

Thus, $x \equiv 0 \pmod{d}$.

Since $x \equiv 0 \pmod{d}$, then:

$$
x + y \equiv y \equiv 0 \pmod{d}
$$
and

$$
2x + y \equiv y \equiv 0 \pmod{d}
$$

So, $y \equiv 0 \pmod{d}$.

Conclusion:

- Both $x \equiv 0 \pmod{d}$ and $y \equiv 0 \pmod{d}$.

In particular:

$$
r \equiv x \equiv 0 \pmod{d}
$$
$$
h \equiv y \equiv 0 \pmod{d}
$$

which means:

$$
r \equiv 0 \pmod{2r+h}
$$
$$
h \equiv 0 \pmod{2r+h}
$$

But since $r \equiv 0 \pmod{d}$, then:

$$
r = k d
$$
for some integer k. Similarly for h.

Now, recall that the question is whether $2r + h$ divides $-r^p$.

But:

$$
- r^p = - (k d)^p = -k^p d^p
$$

and since $d = 2r + h$, and $r \equiv 0 \pmod{d}$, then $r = m d$, with m integer.

Thus,

$$
r^p = (m d)^p = m^p d^p
$$

and:

$$
- r^p = - m^p d^p
$$

which is divisible by d because $d \mid d^p$.

Therefore, **$2r + h = d$ divides $- r^p$**.

Final answer:

Yes, given the initial conditions, **$2r + h$ divides $-r^p$**.

Summary:

- The key step was recognizing that \((r+h)^p \) divisible by \(2r+h \) implies certain congruences.
- These lead to the conclusion that \(r \) and \(h \) are divisible by \(2r+h \).
- Therefore, \(2r+h \) divides \(r^p \) (and hence \(-r^p \)), fulfilling the question.

If you'd like, I can help you explore specific numerical examples or further properties related to this problem!