

Intermediate Algebra
Skill-Building Activity # Pf – 8
Recognizing Perfect Squares and Perfect Cubes

Strategy: Look at the exponents. The factors of a perfect square have exponents that are divisible by 2; the factors of a perfect cube have exponents that are divisible by 3.

Examples

1. $9a^4b^6 = 3^2 a^4 b^6 = \boxed{3a^2b^3}^2$

2. $27x^6y^{15}z^9 = 3^3 x^6 y^{15} z^9 = \boxed{3x^2y^5z^3}^3$

3. $16(n-1)^2 = 4^2 (n-1)^2 = \boxed{4(n-1)}^2$

4. $\frac{8x^{12}}{125z^{21}} = \frac{2^3 x^{12}}{5^3 z^{21}} = \boxed{\frac{2x^4}{5z^7}}^3$

5. $36c^4d^{15} = 6^2 c^4 d^{15}$ is NEITHER a perfect square nor a perfect cube since the exponents are not all divisible by 2 or by 3.

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Decide whether the given expression is a perfect square or a perfect cube and write the correct expression in the correct box.

1. $4x^8$
 Perfect Square

²

Perfect Cube

³

Neither

2. $25y^{16}$
 Perfect Square

²

Perfect Cube

³

Neither

3. $8a^{18}$
 Perfect Square

²

Perfect Cube

³

Neither

4. $\frac{1}{8}w^{36}$
 Perfect Square

²

Perfect Cube

³

Neither

5. $27a^9b^{24}$
 Perfect Square

²

Perfect Cube

³

Neither

6. $64n^8m^{27}$
 Perfect Square

²

Perfect Cube

³

Neither

7. $\frac{16a^{16}}{25b^{20}}$
 Perfect Square

²

Perfect Cube

³

Neither

8. $\frac{1}{27}(y-3)^6$
 Perfect Square

²

Perfect Cube

³

Neither

9. $\frac{49}{81}x^4(1-y)^2$
 Perfect Square

²

Perfect Cube

³

Neither

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Answers

1. $\boxed{2x^4}^2$

2. $\boxed{5y^4}^2$

3. $\boxed{2a^6}^3$

4. $\boxed{\frac{1}{2}w^{12}}^3$

5. $\boxed{3a^3b^8}^3$

6. neither

7. $\boxed{\frac{4a^8}{5b^{10}}}^2$

8. $\boxed{\frac{1}{3}(y-3)^2}^3$

9. $\boxed{\frac{7}{9}x^2(1-y)}^2$