Outcome 1 – Multiplication & Division of Indices

Bronze examples... Silver examples Gold examples

Examples...

Write each of the following in their simplest index form...

When multiplying indices...you ADD the powers.

$a^m \times a^n = a^{m+n}$

$x^4 \times x^5 = x^9$

$6x^9 \times 5x^2 = 30x^{11}$

When dividing indices...you SUBTRACT the powers.

$x^7 \div x^4 = x^3$

$a^m \div a^n = a^{m-n}$

$28x^8 \div 7x^5 = 4x^3$

$\frac{18x^8}{9x^3} = 2x^5$

Examples...

Write each of the following in their simplest index form...

Multiply first...

...then divide!

$\frac{x^3 \times x^5}{x^2} = \frac{x^8}{x^2} = x^6$

$\frac{4x^2 \times 6x^8}{3x^5} = \frac{24x^{10}}{3x^5} = 8x^5$

Examples...

$\frac{1}{2} + \frac{7}{2} = \frac{8}{2} = 4$

Write each of the following in their simplest index form...

Multiply first...

...then divide!

$\frac{x^{\frac{1}{2}} \times x^{\frac{7}{2}}}{x^3} = \frac{x^4}{x^3} = x$

$\frac{10}{3} - \frac{1}{3} = \frac{9}{3} = 3$

$\frac{6x^{\frac{2}{3}} \times 10x^{\frac{8}{3}}}{3x^{\frac{1}{3}}} = \frac{60x^{\frac{10}{3}}}{3x^{\frac{1}{3}}} = 20x^3$

Bronze Questions

Write each of the following in their simplest index form...

1. $x^8 \times x^7$
2. $a^6 \times a^2$
3. $5b^3 \times 7b^4$
4. $9p^4 \times 6p$
5. $k^{12} \div k^3$
6. $d^3 \div d^2$
7. $24y^{10} \div 8y^7$
8. $16r^{14} \div 2r^8$
9. $\frac{18c^7}{6c^5}$
10. $\frac{63h^6}{9h^5}$

Silver Questions

Write each of the following in their simplest index form...

1. $\frac{x^7 \times x^4}{x^6}$
2. $\frac{a^5 \times a^4}{a}$
3. $\frac{b^8 \times b}{b^3}$
4. $\frac{p^8 \times p^{11}}{p^{12}}$
5. $\frac{3k^4 \times 6k^8}{2k^3}$
6. $\frac{6d^9 \times 5d^2}{3d^5}$
7. $\frac{9y^3 \times 2y^4}{6y^5}$
8. $\frac{2r^2 \times 5r^4}{10r^6}$

Gold Questions

Write each of the following in their simplest index form...

1. $\frac{x^{\frac{3}{5}} \times x^{\frac{12}{5}}}{x^2}$
2. $\frac{a^{\frac{6}{7}} \times a^{\frac{29}{7}}}{a^3}$
3. $\frac{b^{\frac{5}{3}} \times b^{\frac{20}{3}}}{b^{\frac{1}{3}}}$
4. $\frac{p^{\frac{7}{11}} \times p^{\frac{18}{11}}}{p^{\frac{3}{11}}}$
5. $\frac{2k^{\frac{3}{8}} \times 8k^{\frac{13}{8}}}{4k}$
6. $\frac{6d^{\frac{17}{6}} \times 4d^{\frac{13}{6}}}{3d^3}$
7. $\frac{8y^{\frac{7}{2}} \times 4y^{\frac{11}{2}}}{2y^2}$
8. $\frac{10r^{\frac{11}{4}} \times 4r^{\frac{25}{4}}}{8r^5}$

Bronze Answers

1. x^{15}
2. a^8
3. $35b^7$
4. $54p^5$
5. k^9
6. d
7. $3y^3$
8. $8r^6$
9. $3c^2$
10. $7h$

Silver Answers

1. x^5
2. a^8
3. b^6
4. p^7
5. $9k^9$
6. $10d^6$
7. $3y^2$
8. 1

Gold Answers

1. x
2. a^2
3. b^8
4. p^2
5. $4k$
6. $8d^2$
7. $16y^7$
8. $5r^4$