

5.1 Page 342 (1, 3, 5, 9, 11, 17, 19, 25, 26)

1. a. $4^{-3} \cdot 4^5 = 4^2 = \boxed{16}$ b. $3^{-3} \cdot 3^6 = 3^3 = \boxed{27}$

3. a. $9^1 (9^{-1/2}) = 9^{(1-1/2)} = 9^{1/2} = \sqrt{9} = \boxed{3}$

b. $5^1 (5)^{-1/2} = 5^{1/2} = \boxed{\sqrt{5}}$

5. a. $\frac{(-3)^4 (-3)^5}{(-3)^8} = (-3)^{4+5-8} = (-3)^1 = \boxed{-3}$

b. $\frac{(2^{-4})(2^6)}{(2^{-1})} = 2^2 \cdot 2^1 = 2^3 = \boxed{8}$

9. a. $(64x^9)^{1/3} = (\sqrt[3]{64})(x^3) = \boxed{4x^3}$

b. $(25x^3y^4)^{1/2} = \sqrt{25} x^{3/2} y^2 = \boxed{5y^2\sqrt{x^3}} = \boxed{5xy^2\sqrt{x}}$

11. a. $\frac{69^{-4}}{39^{-3}} = \frac{29^3}{9^4} = \boxed{\frac{2}{9}}$ → as in 'apple' NOT nine

b. $\frac{4b^{-4}}{12b^{-6}} = \frac{b^6}{3b^4} = \boxed{\frac{b^2}{3}} = \boxed{\frac{1}{3}b^2}$ OR

17. $6^{2x} = 6^6$ so $2x = 6$; $\boxed{x=3}$

19. $3^{3x-4} = 3^5$ so $3x-4=5$; $3x=9$; $\boxed{x=3}$

next page { 25. $3^{2x} - 12 \cdot 3^x + 27 = 0$; let $y = 3^x$; $y^2 - 12y + 27 = 0$
26. $2^{2x} - 4 \cdot 2^x + 4 = 0$; $2^{2x} - 2 \cdot 2^x + 2 = 0$; $2^{2x} - 2^{2x} + 2^{2x} = 0$

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Mr. Kouřiček
5.1 homework cont.

5.1 Pg. 342 (25, 26)

$$25. \quad 3^{2x} - 12 \cdot 3^x + 27 = 0$$

Here's The Trick:

If you let $y = 3^x$ Then you have

$$\begin{aligned} y^2 - 12y + 27 &= 0 \\ (y-3)(y-9) &= 0 \\ y &= 3 \text{ or } y = 9 \end{aligned}$$

$$\begin{aligned} \text{So } 3^x &= 3 \text{ Thus } x = 1 \\ 3^x &= 9 \text{ Thus } x = 2 \end{aligned}$$

$$26. \quad 2^{2x} - 4 \cdot 2^x + 4 = 0$$

From #25 let $y = 2^x$

$$\begin{aligned} y^2 - 4y + 4 &= 0 \\ (y-2)(y-2) &= 0 \\ y &= 2 \\ 2^x &= 2 \text{ Thus } x = 1 \end{aligned}$$