

10 b) $\frac{2(3^{y-2})}{2} = \frac{18}{2} \Rightarrow 3^{y-2} = 9$
 $3^{y-2} = 3^2 \rightarrow y-2 = 2$
 $y = 4$

d) $\frac{2(4^{v+1})}{2} = \frac{1}{2}$
 $4^{v+1} = \frac{1}{2} \rightarrow (2^2)^{v+1} = 2^{-1}$
 $2v+2 = -1$
 $2v = -3 \rightarrow v = \frac{-3}{2}$

e) $\frac{2}{2} = \frac{6(3^{4f-2})}{2}$
 $1 = 3(3^{4f-2})$
 $\frac{1}{3} = 3^{4f-2}$
 $3^{-1} = 3^{4f-2}$
 $-1 = 4f-2$
 $-1+2 = 4f$
 $1 = 4f$
 $\therefore f = \frac{1}{4}$

f) $\frac{27(3^{3x+1})}{3} = \frac{3}{3}$
 $9 \cdot \frac{3^{3x+1}}{9} = \frac{1}{9}$
 $3^{3x+1} = \frac{1}{9}$
 $3^{3x+1} = 3^{-2}$
 $3x+1 = -2$
 $3x = -3$
 $x = -1$

11 a) $2^{x+2} - 2^x = 48$

$2^x \cdot 2^2 - 2^x = 48$

$2^x(2^2 - 1) = 48$

$2^x(3) = 48$

d) $6^{x+1} + 6^{x+2} = 7$

$6^x \cdot 6^1 + 6^x \cdot 6^2 = 7$

$6^x(6^1 + 6^2) = 7$

$6^x(42) = 7$

$6^x = \frac{7}{42}$

$6^x = \frac{1}{6}$
 $6^x = 6^{-1}$
 $x = -1$

c) $2^{a+5} + 2^a = 1056$

$2^a(2^5) + 2^a = 1056$

$2^a(2^5 + 1) = 1056$

$\frac{33 \cdot 2^a}{33} = \frac{1056}{33}$

$2^a = 32$

$2^a = 2^5$

$a = 5$