FECHTER ALGEBRA NAME:_____

For questions 1 – 4, simplify the given expression into a fraction without any exponents.

1) 18^{-4} $\frac{1}{104976}$

2) $\left(\frac{2}{5}\right)^{-3}$ $\frac{125}{8}$ or 15.625

3) $16^{-17} \cdot 16^{17}$ 1

4) $10 \cdot -3^{-5}$ $-\frac{10}{243}$

For questions 5 - 13 simplify the given expression to one without negative exponents.

5) $g^6 \cdot g^{-3}$ g^3

6) $k^{-18} \cdot k^{-4}$ $\frac{1}{k^{22}}$

7) $5x^{-7} \cdot c^{-2}$ $\frac{5}{x^7 c^2}$

8) $(m^{-5})^3$ $\frac{1}{m^{15}}$

9) $h^{-8} \cdot g^{-3} \cdot 4h^7$ $\frac{4}{hg^3}$

10) $yz^3 \cdot y^{-2}z^{-3}$ $\frac{1}{y}$

11) 11^{-j} $\frac{1}{11^j}$

12) $56a^{-n}b^{-3}a^{-4}$ $\frac{56}{a^{n+4}b^3}$

13) $c^{-2} \cdot 2^{-5} \cdot c^{-6}$ $\frac{1}{32c^8}$

For questions 14 – 18, give examples of two different pairs of values for a and b that satisfy the equation.

14) $6^a \cdot 6^b = 1$ $a=4\ b=-4$ and $a=2\ b=-2$

15) $15^a \cdot 15^b = 15^{-3}$ $a=1\ b=-4$ and $a=-5\ b=2$

16) $d^a \cdot d^b = d^9$ $a=8\ b=1$ and $a=5\ b=4$

17) $(9^a)^b = 9^{12}$ $a=3\ b=4$ and $a=6\ b=2$

18) $(f^a)^b = f^{-32}$ $a=-4\ b=8$ and $a=-16\ b=2$

_____ and _____

19) Sarah has $14,000 in a 401k plan that has been making 3.56% interest per year. Assuming she did not add or subtract any money from her account, how much did she have 8 years ago?

$14000(1.0356)^{-8} = \$10,582.58$

20) Bacteria doubles in numbers every six hours. If there are currently 45,678 bacteria in a petri dish, how many were there three days ago?

$45,678(2)^{-12} \approx 11$

21) Kohl's is having a sale on shoes. For every day that goes by, they lower the price by 5%. If a pair of shoes currently costs $58, how much did they cost 4 days ago?

$58(.95)^{-4} = \$71.21$

22) Arianna has $4,700 in a bank account that earns 6% interest compounded monthly.

a) How much did she have in the account 5 years ago?

$4700\left(1+\frac{.06}{12}\right)^{12 \cdot -5}$ $\$3484.45$

b) How much will she have 5 years from now? $\$6339.60$

23) Steve currently has $30,000 invested in the stock market. Unfortunately, he has been losing 4% interest compounded annually.

a) How much did he have 8 years ago? $30,000(.96)^{-8}$ $\$41,586.41$

b) How much will he have 8 years from now? $\$21,641.69$