Name: _____

Group: _____ Date: _____

Objective 4.1 To understand integral exponents

4

1. Given $2^5 = 32$,
   - *a)* What is the base? _____
   - *b)* What is the solution? _____
   - *c)* What is the exponent? _____

2. Given $10^3 = 1000$,
   - *a)* What is the power? _____
   - *b)* What is the exponent? _____
   - *c)* What is the base? _____

3. Determine the value of the following powers.

a) $6^3 =$ _____	*b)* $8^2 =$ _____	*c)* $3^2 =$ _____
d) $4^1 =$ _____	*e)* $7^2 =$ _____	*f)* $5^3 =$ _____
g) $10^2 =$ _____	*h)* $2^3 =$ _____	*i)* $2^5 =$ _____
j) $4^4 =$ _____	*k)* $9^3 =$ _____	*l)* $0^4 =$ _____

4. Find the missing exponent.

a) $10^{\blacksquare} = 10\,000$ $\blacksquare =$ _____	*b)* $5^{\blacksquare} = 625$ $\blacksquare =$ _____	*c)* $3^{\blacksquare} = 27$ $\blacksquare =$ _____
d) $2^{\blacksquare} = 128$ $\blacksquare =$ _____	*e)* $7^{\blacksquare} = 1$ $\blacksquare =$ _____	*f)* $10^{\blacksquare} = 10$ $\blacksquare =$ _____
g) $4^{\blacksquare} = 64$ $\blacksquare =$ _____	*h)* $13^{\blacksquare} = 169$ $\blacksquare =$ _____	*i)* $2^{\blacksquare} = 1$ $\blacksquare =$ _____
j) $6^{\blacksquare} = 1296$ $\blacksquare =$ _____	*k)* $20^{\blacksquare} = 400$ $\blacksquare =$ _____	*l)* $8^{\blacksquare} = 512$ $\blacksquare =$ _____

5. Determine the base.

a) _____ $^{10} = 1$	*b)* _____ $^{3} = 125$	*c)* _____ $^{2} = 196$
d) _____ $^{2} = 64$	*e)* _____ $^{3} = 64$	*f)* _____ $^{6} = 64$
g) _____ $^{5} = 100\,000$	*h)* _____ $^{4} = 81$	*i)* _____ $^{1} = 24$
j) _____ $^{4} = 16$	*k)* _____ $^{5} = 243$	*l)* _____ $^{2} = 100$

6. Write in expanded factor form.

a) $3^4 =$ _____	*b)* $7^2 =$ _____
c) $m^5 =$ _____	*d)* $a^3 =$ _____
e) $5^2 =$ _____	*f)* $b^1 =$ _____

7. Write each of the following numbers in exponential form.

a) $49 =$ _____ ***b)*** $125 =$ _____ ***c)*** $216 =$ _____

d) $32 =$ _____ ***e)*** $27 =$ _____ ***f)*** $169 =$ _____

8. Express each word as power of 10.

a) A thousand. _____ ***b)*** A hundred thousand. _____ ***c)*** One. _____

d) One million. _____ ***e)*** One tenth. _____ ***f)*** One thousandth. _____

9. Complete the property of the exponents.

1. Given a base m and an integer exponent $a > 1$,

   $m^a =$ _____ .

2. Given a base m and the exponent 1,

   _____ = _____ .

3. Given a base $m \neq 0$ and the exponent 0,

   $m^{-a} =$ _____ .

4. Given a base $m \neq 0$ and an integer exponent $a > 0$,

   _____ = _____ .

5. Given a base $m > 0$ and the exponent 1/2,

   _____ = _____ .

10. Determine the power of the following expressions.

a) $3^2 =$ _____ ***b)*** $5^1 =$ _____ ***c)*** $8^0 =$ _____

d) $6^{-2} =$ _____ ***e)*** $9^{1/2} =$ _____ ***f)*** $7^3 =$ _____

g) $2^1 =$ _____ ***h)*** $5^0 =$ _____ ***i)*** $10^{-1} =$ _____

j) $16^{1/2} =$ _____ ***k)*** $2^4 =$ _____ ***l)*** $6^1 =$ _____

m) $3^0 =$ _____ ***n)*** $2^{-1} =$ _____ ***o)*** $100^{1/2} =$ _____

11. Determine the power of the following expressions.

a) $(-3)^2 =$ _____ ***b)*** $(-3)^4 =$ _____ ***c)*** $(-3)^6 =$ _____

d) $(-3)^1 =$ _____ ***e)*** $(-3)^3 =$ _____ ***f)*** $(-3)^5 =$ _____

12. What can you conclude from the results obtained in 11?

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