Unit #3 – Exponents

MPM1D1

Progress Check

The purpose of the progress check is to diagnose areas that you need more practice with before the test.

1. Review your notes before trying the questions in this package.
2. Answer the questions on this handout. Treat it like a test. DO NOT look at the answers until you have finished all of the questions.
3. Use the answers provided to check and see how you did.
4. Go to the course website (**http://sites.google.com/a/hdsb.ca/TAB-MPM1D1**) if you need to see the full worked out solutions (click on Unit #5).
5. Use the additional review questions provided in the textbook (see unit outline) to practice more questions like the ones you had trouble with in this package.
6. Although this progress check contains a wide selection of questions from this unit, it does not cover ALL of the possible questions from the unit.

1. Evaluate each of the following.

a) 5^3 b) $\left(\frac{3}{4}\right)^5$ c) 10^0 d) $(-2)^8$ e) -2^8

2. Simplify each of the following. Write your final answer as a single power.

a) $6^3 \times 6^5$ b) $(12^2)(12^6)(12^{-3})$ c) $(a^{10}b^6c^3)(a^4b^2c^4)$

d) $x^5 \div x^2$ e) $3^{10} \div 3^{-2} \div 3^8$ f) $\frac{w^9x^6y^4z^5}{w^3xz^5}$

g) $(m^8)^2$ h) $(4^0)^2$ i) $[(x^3y^9)^5]^2$

j) $2x^0 + (2x)^0$ k) $5ab^0 + 3a^0b - 2^0ab^0$

3. Simplify each of the following. Write your final answer as a single power

a) $\dfrac{7^3 \times 7^{10}}{7^8}$ b) $\dfrac{(p^2)^3 \times (p^4)^5}{(p^8)^2}$ c) $\left(\dfrac{a^{15}b^{13}}{(a^2 b^3)(a^7 b^9)}\right)^8$

4. Simplify each of the following.

a) $(4a^3b)(2a^7b^2c)$ b) $(6a^7b^5c^3)^4$ c) $\dfrac{(4a^3b^7cd)(5ab^3c^8d^2)^2}{20ab^4}$

5. Expand and simplify.

a) $5x(2x^2 + 4x - 3)$ b) $3a(2a + 4) + 5a(2 - a) + 9$ c) $4x(3x - 2) + 10x(x + 1)$

6. Evaluate $4x^3 - 5y^2$ if $x = 3$ and $y = -2$.

7. Write each of the following numbers as a power with a base of 2 and then simplify using exponent laws.

a) $2^3 \times 32 \div 8$ b) $\dfrac{128^3}{2^3}$

8. Rearrange each of the following formulas for the indicated variable.

a) $I = Prt$, for t

b) $F = 0.8C + 32$, for C

c) $P = 2(L + W)$, for W

d) $V = \frac{\pi r^2 h}{3}$, for h

e) $S = 0.3(b - 2c)$, for b

f) $V = \frac{\pi r^2 h}{3}$, for r

9. Determine the value of A that makes each of the following true.

a) $(x^9)(x^A) \div x^5 = x^{11}$

b) $x^8(x^4)^A = x^{24}$

c) $3x^5(Ax^4) = 45x^9$

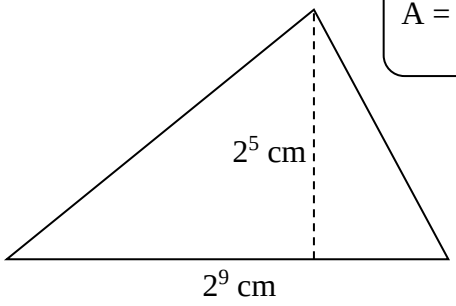
10. Sven answered the following questions. Determine whether or not his answer for each is correct. Explain your reasoning in words.

a) $(6x^3)(2x^3) = 8x^9$

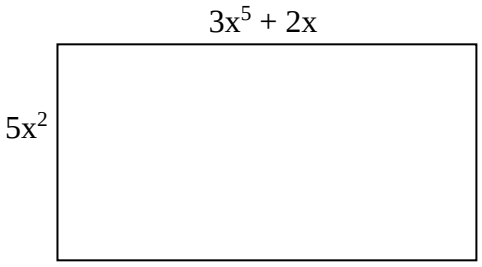
b) $6x^3 + 2x^3 = 8x^3$

11. Calculate the area of the following triangle. Write your answer as an exponent

$A = \frac{bh}{2}$



12. Write a simplified expression for the area of the following rectangle.



13. A baseball pitcher's "Game Score" *G* is calculated using the following formula, where *T* is the number of outs, *I* is the number of innings pitched, *S* is the number of strikeouts, *H* is the number of hits, *R* is the number of earned runs, *W* is the number of walks, and *L* is the number of stolen runs.

$$G = 50 + T + 2(I - 4) + S - 2H - 4R - W - 2L$$

Manuel pitched 5 innings with a Game Score of 36. He pitched 9 hits and only 1 walk. There are a total of 15 outs, no stolen runs, and 3 earned runs. How many strikeouts did he have?

Answers:

1a] 125 1b] 243/1024 1c] 1 1d] 256 1e] -256 2a] 6^8 2b] 12^5 2c] $a^{14}b^8c^7$ 2d] x^3 2e] 3^4 2f] $w^6x^5y^4z^0$ or $w^6x^5y^4$
2g] m^{16} 2h] 4^0 or 1 2i] $x^{30}y^{90}$ 2j] 3 2k] 4a + 3b 3a] 7^5 3b] p^{10} 3c] $a^{48}b^8$ 4a] $8a^{10}b^3c$ 4b] $1296a^{28}b^{20}c^{12}$ 4c] $5a^4b^9c^{17}d^5$
5a] $10x^3 + 20x^2 - 15x$ 5b] $a^2 + 22a + 9$ 5c] $22x^2 + 2x$ 6] 88 7a] 2^5 7b] 2^{18}

8a] $t = \frac{I}{Pr}$ 8b] $C = \frac{F-32}{0.8}$ 8c] $W = \frac{P-2L}{2}$ 8d] $h = \frac{3V}{\pi r^2}$ 8e] $b = \frac{s+0.6C}{0.3}$ 8f] $r = \sqrt{\frac{3V}{\pi h}}$ 9a] A = 7 9b] A = 4 9c] A = 15

10a] Incorrect. Since this is a multiplication question, he should multiply the 6 and 2 to get 12 and then add the exponents on the x to get $12x^6$.
10b] Correct. Because both terms have the same variable and exponent they are like terms and can be added together.
11] 2^{13} cm^2 12] $15x^7 + 10x^3$ 13] 0 strikeouts