

## MATH 103 – Order of Operations, Exponents, Divisibility, Division Theorem

1. Compute and simplify each of the following quantities.

(a)  $6 \times (8 \div 2)$

(b)  $24 \div 4 \times 3$

(c)  $5 \times 2^3$

(d)  $120 - 20 \times 5 + 45 \div 3$

(e)  $2 \times (4 + 40) \div 2^3$

2. What is the value of  $123456789^0$  ?

3. Find whole number values for  $a$  and  $b$  so that each of the following quantities can be expressed as  $a^b$ .

(a)  $6^{15} \times 6^5$

(b)  $10^{25} \div 10^7$

(c)  $2^{10} + 2^{10} + 2^{10} + 2^{10}$

(d)  $2^{87} \times 3^{87}$

(e)  $3^{200} \times 5^{200} \times 15^{300}$

4. Circle **T** for true or **F** for false for each of following statements.

(a) **T** or **F**:  $6|32$

(b) **T** or **F**:  $8|56$

(c) **T** or **F**:  $81|9$

(d) **T** or **F**:  $0|2$

(e) **T** or **F**:  $4|0$

(f) **T** or **F**:  $1|3$

(g) **T** or **F**:  $2|1$

5. Circle each number below which is divisible by 7.

0    1    7    21    283

6. Circle each number below which is a divisor of 10.

0    1    2    4    5    10    15    20

7. Circle each number below which is a multiple of 15.

0    1    3    5    10    15    45    165

8. Circle **T** for true or **F** for false for each of following statements.

- (a) **T** or **F**: 5555533333 is divisible by 5
- (b) **T** or **F**: 2 is a divisor of 111333555777999000
- (c) **T** or **F**: 987654321 is a multiple of 3
- (d) **T** or **F**: 635497 is divisible by 3
- (e) **T** or **F**: 9 is a divisor of 77781188118222
- (f) **T** or **F**: 90090090090090090090011100900009 is divisible by 9
- (g) **T** or **F**: 4 is a divisor of 37439277645972398347928387347340
- (h) **T** or **F**: 424242424242424242424242 is a multiple of 4
- (i) **T** or **F**: 8 is a factor of 3746483846583923164
- (j) **T** or **F**: 8364932864956498056 is divisible by 8
- (k) **T** or **F**: 6 is a divisor of 450450450450450450450450450
- (l) **T** or **F**: 636363636363636363636363636 is a multiple of 11
- (m) **T** or **F**: 11 is a divisor of 12321
- (n) **T** or **F**: 7 is a factor of 21000700035
- (o) **T** or **F**: 13039031 is a multiple of 13

9. What digit  $d$  will result in  $19352d$  being divisible by 11 ?

10. When 17 is divided by 3 the *Division Theorem* yields which of the following equations?

- (a)  $17 = 3 \times 1 + 14$
- (b)  $17 = 3 \times 2 + 11$
- (c)  $17 = 3 \times 3 + 8$
- (d)  $17 = 3 \times 4 + 5$
- (e)  $17 = 3 \times 5 + 2$
- (f)  $17 = 3 \times 6 - 1$

11. What is the remainder when 453600270023 is divided by 9 ?

12. What is the remainder when 729 is divided by 9 ?

13. What is the remainder when 375397525 is divided by 4 ?

14. What is the remainder when 9473046393838 is divided by 5 ?

15. What is the remainder when 357750 is divided by 7 ?