

Summer Math Review 2017
For Section 11 College Prep

- *You should not use a calculator for this work, except for question 18.*
- *Work on a separate sheet of paper.*
- *Show all work.*

1. Evaluate the following:

a. $2(-5)$

b. $(-2)(-5)$

c. $\frac{5}{-2}$

d. $\frac{-5}{-2}$

e. $(-5) + 2$

f. $(-5) + (-2)$

g. $(-5) - (-2)$

h. $-3 + (-7) + 5 + (-4) + (-6)$

i. $12 - (-22) + (-2) - 32$

j. $-1 - (2 - 3) - (4 - 5 - 6)$

2. Evaluate:

a. $\frac{2}{3} + \frac{3}{4}$

b. $\frac{2}{3} - \frac{3}{4}$

c. $\frac{2}{3} \cdot \frac{3}{4}$

d. $\frac{2}{3} \div \frac{3}{4}$

3. Solve the following equations:

a. $2x + 3 = 7$

b. $3(x - 2) = 15$

c. $\frac{1}{3}x - 4 = 3$

d. $x^2 = 9$

4.

a. Find the slope of the line that connects the points (3,1) and (5,-3).

b. Find an equation of the line that connects the points (3,1) and (5,-3).

c. What is the slope of a line perpendicular to this line?

5. Simplify the following:

a. $x^3 \cdot x^5$

b. $\frac{x^7}{x^4}$

c. $(x^3)^4$

d. $(2x)^3$

e. $\left(\frac{2}{3}\right)^2$

6. Simplify the following expressions:

a. $(2x + 5) - (3x - 3)$

b. $(3x + 1)(5x - 4)$

c. $(5x^2 + 4x + 2) - (2x^2 + 6x - 1)$

d. $3(2x - 1) + 4(3x + 4)$

7. Factor:

a. $2x - 6$

b. $15x^4 + 10x^5$

c. $3xy + 33x^2y$

d. $x^2 - 4x - 12$

8. Use your answer to 7d. to solve the equation $x^2 - 4x - 12 = 0$.

9. A rectangle has a length of $2x - 1$ and a width of $x + 3$. Find the area of the rectangle in terms of x .

10. Write an equation that expresses the following sentence: y is two less than three times a number x .

11. Graph the following equations:

a. $y = 2$

b. $x = -1$

c. $y = 2x - 1$

d. $y = x^2 - 2x - 3$

12. Given $f(x) = x^2 - x + 1$,

i. evaluate $f(3)$

ii. find the values of x that make $f(x) = 1$

13. Given that $f(x) = 3x - 2$, find

i. $f(2d)$

ii. $f \circ f\left(\frac{1}{3}\right)$

iii. $f^{-1}(x)$

iv. $f^{-1} \circ f(\sqrt{2} - 1)$

14. Simplify.

a. $4 + 6 \cdot 2 - 5$

b. $25 - 10 \div 2$

c. $3 + (5 - 2) + 6^2$

d. $\frac{4^2 - 20 \div 5}{1 - 5 + 7}$

e. $3[2 + (5 + 2^3)]$

f. $(3^2 - 4^2)^2$

15. Evaluate

a. $8x^2 + x - 9$ for $x = 2$

b. $14x - (2y + z)$ for $x = 3, y = 4, z = 5$

c. $\frac{21xy}{x+y}$ for $x = 3, y = 4$

16. A particular political campaign has constant weekly running costs. If it costs \$640,000 to run the campaign for 4 weeks, how long would the campaign cost to run for 9 weeks?

17. A group of 12 people, working together, can complete a math task in 5 minutes. Assuming each individual works at the same rate and contributes equally, how long would the same task take to complete for a group of

i. 10 people?

ii. 30 people?

iii. 8 people?

18. Use the quadratic formula to solve $x^2 - 4x + 2 = 0$, giving answers correct to 2 decimal places.

19. Solve the equation $\frac{x-1}{2} = \frac{6}{x-2}$

20. At an ice cream parlor, David has the choice of three cone sizes, six flavors and five toppings. Assuming David chooses a cone with one flavor ice cream and one topping, how many total choices does he have?