

Summer Math Review 2017
For Section 8 Accelerated

- You should **not** use a calculator for this work.
- Work on a separate sheet of paper, except for questions 12, 13a, and 14c,d which you should complete on this sheet.
- Rewrite the problem on your separate sheet of paper. Show all work.

1. Simplify each expression:

a. $a + a$

b. $b \cdot b$

c. $3m + m + m$

d. $5 + d \cdot d \cdot d$

e. $f \cdot f - g \cdot g \cdot g$

f. $8k \cdot k$

2. Evaluate the following expressions when $g = 4$, $h = 3$, $j = -4$, and $k = 5$.

Where applicable, write your final answer as a fraction in simplest form

a. $3k^2 + 3$

b. $\frac{2j^2}{h}$

c. $\frac{(k+5)^2}{j}$

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

e. k^{-2}

3. Use the distributive property to expand each expression.

a. $5(x + 3)$

b. $6(3 - m)$

c. $-3(x - 2)$

4. Simplify by combining like terms:

a. $3x^2 + 2x - 5 - x^2 + 7$

b. $2x + 3(x - 5) + 4$

c. $5x(2 - x) - (x - x^2)$

5. Restate each number as a product of prime numbers (prime factorization), then as a product of power expressions if possible.

Example: $100 = 2 \cdot 2 \cdot 5 \cdot 5 = 2^2 \cdot 5^2$

a. 8

b. 54

c. 96

6. Restate as a single power expression:

a. $t^3 \cdot t^6$

b. $(t^3)^6$

c. $3a^4 \cdot 5a^3$

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

e. $(x^7)^{\frac{1}{7}}$

7. Evaluate:

a. $5^2 + 5^3$

b. $5^2 \cdot 5^3$

c. $\frac{8^{10}}{8^{12}}$

d. $\left(\frac{1}{3}\right)^2$

e. $(2^3)^2$

f. $\left(\frac{2}{5}\right)^7 \cdot \left(\frac{5}{2}\right)^9$

8. Evaluate:

a. $3 + (-8)$

b. $-7 - 12$

c. $27 - (-43)$

d. $|-10^2|$

e. $\sqrt{144} \cdot \sqrt{16}$

f. $4.5 + (-3.5)$

g. $\frac{1}{5} - \left(-\frac{9}{5}\right)$

h. $2 + 3 \cdot 7$

i. $4 + 3^2$

j. $(3 + 2)^2$

k. $-4 \cdot 3 \cdot (-0.5)$

l. $(-4)^2$

m. $\frac{1+2^3}{3^2}$

n. -3^2

9. Use a $>$ or $<$ or $=$ sign between each pair of values below. Explain how you can tell.

a. -2^6 $(-2)^6$

b. $(-2)^7$ -2^7

c. $(-2)^7$ -2^8

10. Rewrite as a single power expression without negative exponents, then evaluate.

a. $2^5 \cdot 2^{-6}$

b. $7^{23} \cdot 7^{-23}$

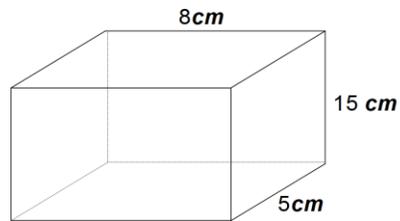
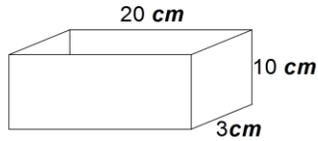
c. $\left(\frac{1}{5}\right)^{-2}$

d. $(-3)^{-2}$

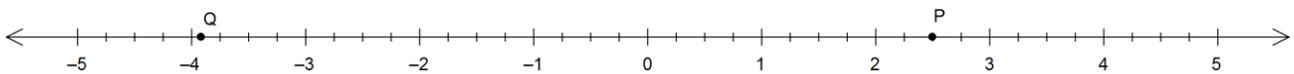
e. $4^{-1} \cdot 2^4$

11. The prisms below are NOT drawn to scale.

- The prisms pictured below have the same volume. What is it?
- The prisms do not have the same surface area. Which has more surface area? By how much?



12. This question is about rational numbers.



- What is the coordinate of point P on the number line?
- What is the coordinate of point Q on the number line?
- Plot point V at -4.
- Plot point R at $-\frac{9}{4}$.
- Plot point S at $\frac{3}{2}$. Plot point T at the opposite of point S.
- Plot point U at the sum of points R and S. Is the coordinate for U positive or negative? Why?

13. Shilo has \$230 in the bank. He deposits \$5 per month.

a. Complete the table below to show his bank balance.

m (months)	0	1	2	10	20	
b (money)	230					500

b. Write an equation to show how much he will have, b , after m months.

c. If Batya starts with only \$100, but saves \$10 per month, how long will it take until she has a greater balance than Shilo?

14. The M-Cats rent a basketball court for \$150. They sell tickets for \$7 per person.

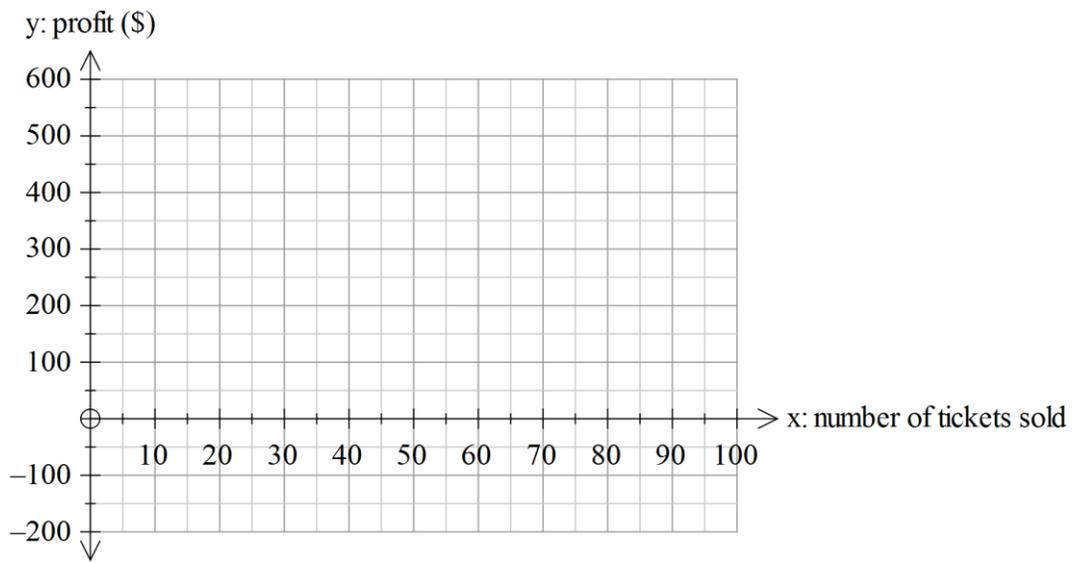
a. If x people attend the game, write an expression to show how much money they will have after paying the rent.

b. How many people need to come to the game for them to break even?

c. Complete the table below.

x (people)	0	10	20	30		100
y (profit)					95	

d. Graph the data on the axes provided:



15. Sharona wrote the following three equations to describe costs for different sweatshirt companies.

Joe's Sweatshirts $C = 8x + 30$

Super Sweats $C = 9x$

Stylin' Threads circa 1970 $C = 10x - 25, \text{ when } x > 20$

- Identify the slope and y -intercept of the first two equations.
- One company charges extra for shipping. Which is it, and how much does shipping cost?
- One company gives you a discount if you buy at least 20 sweatshirts. Which company is it, and how much is the discount?
- We plan to buy 45 sweatshirts. Which company should we use? Why?
- Sharona tells you that in part d., $\frac{3}{4}$ of the class bought sweatshirts. How many students are in the class?

16. Solve for x :

a. $7x + 11 = 60$

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

c. $\frac{3x+1}{4} = 7$

d. $\frac{2x}{5} - 7 = -1$

17.

- a. If the cost of T-shirts is proportional to the number ordered, and we paid \$180 for 36 T-shirts, how much will 9 T-shirts cost?
- b. In the same situation, how much will 90 T-shirts cost?
- c. Still the same scenario, how much will 1 T-shirt cost?
- d. Write a rule using the letters x and y that describes the total cost for any number of shirts ordered.

18. Each time Yael takes her baby to the pediatrician, the nurse tells her the baby's height and weight. Yael wants to graph her baby's growth by plotting weight (on the x -axis) vs. height (on the y -axis). For example, at 2 weeks of age, the baby weighed 7.5 lbs and was 21 inches long, so she placed a point at (7.5, 21). As the child grows and points are added, does it make sense for Yael to connect the points? Why or why not?