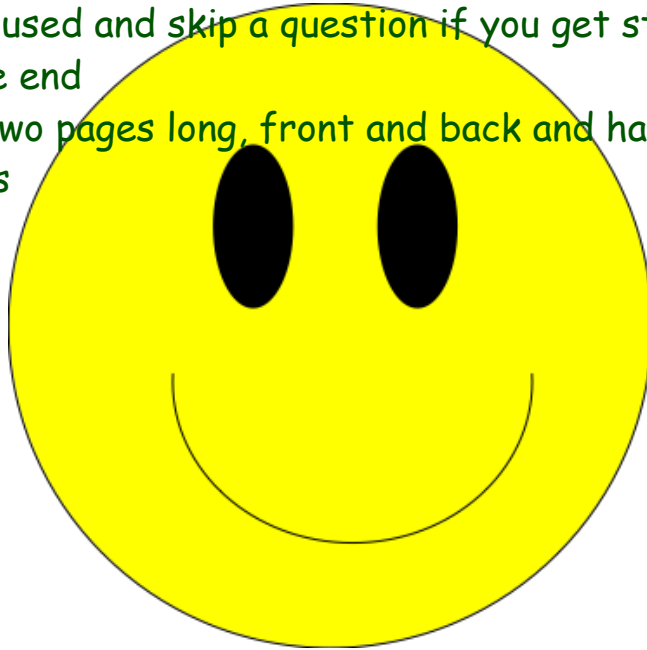


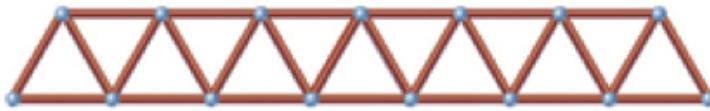
TWMM Test Outline Algebra 8r

- 1.) Test will cover the main ideas from TWMM Investigations 1 and 2 in your text
- 2.) Test will be worth 100 points, most questions worth 5 points unless noted
- 3.) Try to show some thinking for each question to earn maximum credit
- 4.) You may use a calculator but no notes
- 5.) You will be given the entire class period, but no extra time will be given so stay focused and skip a question if you get stuck and come back to it at the end
- 6.) Test will be two pages long, front and back and have approximately fifteen questions



The following are some practice problems to give you some extra practice to be better prepared. The solutions can be found on the last few pages. "Hard Work = Success!"

- 57.** Recall that Custom Steel Products builds beams from steel rods. Here is a 7-foot beam.



7-foot beam made from 27 rods

Write an equation for the number of rods needed to make the n th foot beam. Is the pattern linear? How do you know?

- 25.** The following formulas give the fare f in dollars that two bus companies charge for trips of d miles.

Transcontinental: $f = 0.15d + 12$

Intercity Express: $f = 5 + 0.20d$

In parts (a)–(c), use a graph to estimate the answer. Then, find the answer by writing and solving an equation or inequality.

- a.** For Transcontinental, how many miles is a trip that costs \$99?
- b.** For Intercity Express, how far can a person travel for a fare that is at most \$99?
- c.** Is there a distance for which the fare for the two bus lines is the same? If so, give the distance and the fare.

3.)

7	33
10	54
13	75
16	96
19	117
22	138

What is the equation for the table above? What would the y value be if $x = 28$?

63. Write an equation for each relationship.

- a.** One taxi company charges \$1.50 for the first 2 miles of any trip, and then \$1.20 for each mile after that. How is the taxi *fare* related to the *distance* of a trip?
 - b.** An airport offers free parking for 30 minutes and then charges \$2.00 for each hour after that. How is the *price* for parking related to the *time* a car is parked?
 - c.** A local cinema makes \$6.50 on each ticket sold. However, it has operating expenses of \$750 per day. How is *daily profit* related to *number of tickets* sold?
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- 32.** Study the patterns in this table. Note that the numbers in the x column may not be consecutive after $x = 6$.

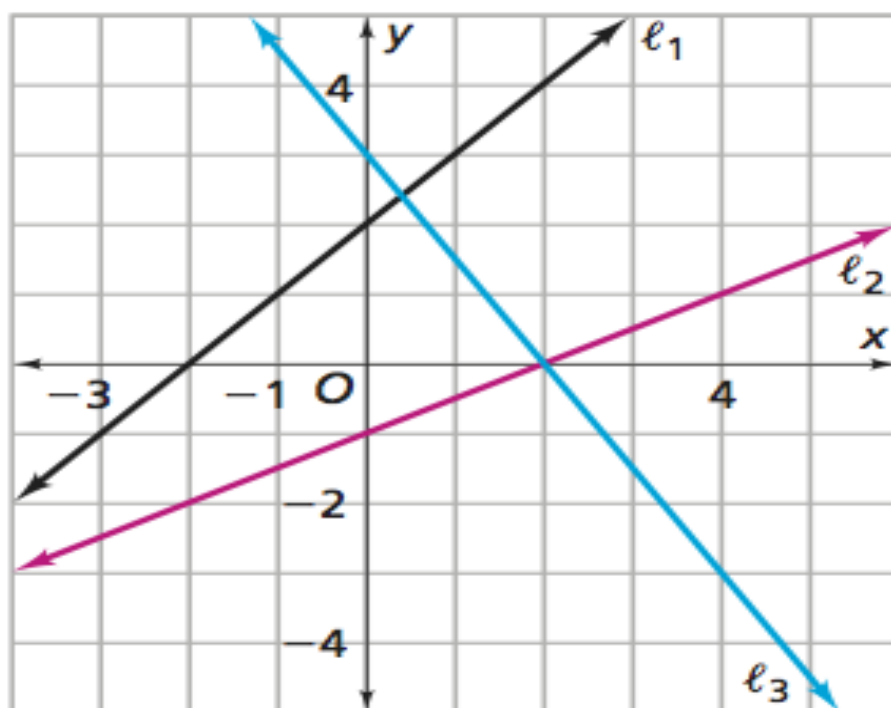
x	p	q	y	z
1	1	1	2	1
2	4	8	4	$\frac{1}{2}$
3	9	27	8	$\frac{1}{3}$
4	16	64	16	$\frac{1}{4}$
5	25	125	32	$\frac{1}{5}$
6	■	■	■	■
■	■	■	1,024	■
■	■	■	2,048	■
■	■	1,728	■	■
n	■	■	■	■

- a.** Use the patterns in the first several rows to find the missing values.
- b.** Are any of the patterns linear? Explain.

4.) Find the equation of the line passing through the given points and show your thinking algebraically.

Pass through points $(4, 44)$ and $(16, 128)$

18. Write an equation for each line.



Solve the equation showing transformation lines and properties of equality.

$$20) -5(1 - 5x) + 5(-8x - 2) = -4x - 8x$$

57. a. $r = \ell + (\ell - 1) + 2\ell$, $r = 4(\ell - 1) + 3$, and $r = 4\ell - 1$

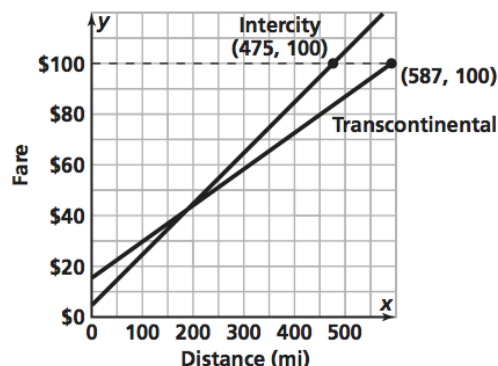
b. Possible explanations:

$r = \ell + (\ell - 1) + 2\ell$: There are ℓ rods along the bottom, $\ell - 1$ rods along the top, and 2 additional diagonal rods for every foot.

$r = 4(\ell - 1) + 3$: We start with 3 rods and then add 4 for each additional foot.

$r = 4\ell - 1$: Look at each 1-foot segment, except the last, as a triangle with a rod extending from the top like the one below. The last foot does not require the top segment, so we need to subtract one.

25.



- a. 580 mi; $99 = 0.15d + 12$, so $d = 580$ mi
 b. 470 mi; $99 = 5 + 0.20d$, so $d = 470$ mi
 c. Yes; about 140 mi and \$33;
 $0.15d + 12 = 5 + 0.20d$, so $d = 140$

3.) $y = 7x - 16$ and when $x = 28$ $y = 180$

63. a. The Bluebird Taxi rule has two parts. For distances less than 2 mi, $f = 1.50$; for distances of 2 mi or more, $f = 1.2(d - 2) + 1.5$, because d is the distance in mi and f is the fare.
- b. The parking charge rule needs two parts—one for times of 30 min or less and one for times greater than 30 min (or 0.5 hr). Furthermore, the way these charge schemes usually work, the charge for any time between 0.5 hr and 1.5 hr will be \$2. Then the charge for any time between 1.5 hr and 2.5 hr will be \$4, and so on. This is hard to express as a simple algebraic rule, but one could use $p = 2(t - 0.5)$, where p is price and t is time, and then round the result up to the nearest \$2. For example, if $t = 4.7$, $p = 2(4.7 - 0.5) = 2(4.2) = 8.4$, which would round up to \$10.
- c. $p = 6.50n - 750$, where p is the profit in dollars and n is the number of tickets sold.
- d. $c = 50 + 50t$, where t is the repair time required and c is the cost for the repair.

32. a.

x	p	q	y	z
1	1	1	2	1
2	4	8	4	$\frac{1}{2}$
3	9	27	8	$\frac{1}{3}$
4	16	64	16	$\frac{1}{4}$
5	25	125	32	$\frac{1}{5}$
6	36	216	64	$\frac{1}{6}$
10	100	1,000	1,024	$\frac{1}{10}$
11	121	1,331	2,048	$\frac{1}{11}$
12	144	1,728	4,096	$\frac{1}{12}$
n	n^2	n^3	2^n	$\frac{1}{n}$

b. None of the patterns are linear because a constant change in x does not yield a constant change in y .

$$20) -5(1 - 5x) + 5(-8x - 2) = -4x - 8x$$

$\{-5\}$

$$4.) y = 7x + 16$$

$$18. \ell_1: y = x + 2; \ell_2: 0.5x - 1; \ell_3: -1.5x + 3$$