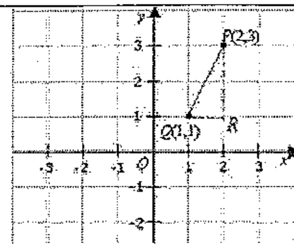
Finding Distance

The Pythagorean Theorem can be used to find distance in a coordinate plane. We can count the units vertically or horizontally, but not diagonally. So, we can create a right triangle and use $a^2+b^2=c^2$



1. Connect the two points
2. Create a right triangle
3. Count the spaces for the legs.

$a^2+b^2=c^2$
$1^2+2^2=c^2$
$1+4=c^2$
$5=c^2$
$\sqrt{5}=\sqrt{c^2}$
$\sqrt{5}=c$
OR
$2.2\approx c$

Converse

The converse of the Pythagorean Theorem states that IF $a^2+b^2=c^2$, you have a right triangle. It can be used to determine whether three side lengths could form a right triangle.

Can 3, 4, 5 form a right triangle?
$a^2+b^2=c^2$
$3^2+4^2=5^2$
$9+16=25$
$25=25$
Yes, these could form a right triangle.

Can 6, 8, 9 form a right triangle?
$a^2+b^2=c^2$
$6^2+8^2=9^2$
$36+64=81$
$100\neq 81$
No, these could not form a right triangle

I can solve linear equations in one variable including those with distributive property

$26 = 8 + v$ $-8 \quad -8$ $18 = v$	$-15 + n = -9$ $+15 \quad +15$ $n = 6$	$-104 = 8x$ $\frac{-104}{8} = \frac{8x}{8}$ $-13 = x$	$8 \cdot \frac{v}{8} = 2 \cdot 8$ $v = 16$
$-9x + 1 = -80$ $-1 \quad -1$ $\frac{-9x}{-9} = \frac{-81}{-9}$ $x = 9$	$-4 = 2 + \frac{v}{4}$ $-2 \quad -2$ $4 \cdot -6 = \frac{v}{4} \cdot 4$ $-24 = v$	$-104 = 10 - 6v$ $-10 \quad -10$ $\frac{-114}{-6} = \frac{-6v}{-6}$ $v = 19$	$\frac{n}{-16} + 5 = -1$ $-5 \quad -5$ $-16 \cdot \frac{n}{-16} = -6 \cdot -16$ $n = 96$
$2(n+5) = -2$ $2n + 10 = -2$ $-10 \quad -10$ $\frac{2n}{2} = \frac{-12}{2}$ $n = -6$	$84 = 7(9 + k)$ $84 = 63 + 7k$ $-63 \quad -63$ $\frac{21}{7} = \frac{7k}{7}$ $3 = k$	$-10 = 10(k - 9)$ $-10 = 10k - 90$ $+90 \quad +90$ $\frac{80}{10} = \frac{10k}{10}$ $8 = k$	$3(3v + 1) = 48$ $9v + 3 = 48$ $-3 \quad -3$ $\frac{9v}{9} = \frac{45}{9}$ $v = 5$
$P - 1 = 5p + 3p - 8$ $p - 1 = 8p - 8$ $-p \quad -p$ $-1 = 7p - 8$ $+8 \quad +8$ $\frac{7}{7} = \frac{7p}{7}$ $p = 1$	$p - 4 = -9 + 2p$ $-p \quad -p$ $-4 = -9 + p$ $+9 \quad +9$ $5 = p$	$5n + 34 = -2(1 - 7n)$ $5n + 34 = -2 + 14n$ $-5n \quad -5n$ $34 = -2 + 9n$ $+2 \quad +2$ $\frac{36}{9} = \frac{9n}{9}$ $4 = n$	$-18 - 6k = 6(1 + 3k)$ $-18 - 6k = 6 + 18k$ $+6k \quad +6k$ $-18 = 6 + 24k$ $-6 \quad -6$ $\frac{-24}{24} = \frac{24k}{24}$ $k = -1$

$6x - 10 = 3x + 5 + 3(x - 5)$ $6x - 10 = 3x + 5 + 3x - 15$ $6x - 10 = 6x - 10$ $-6x \quad -6x$ $-10 = -10$ infinite solutions	$2x + 5 + 3x - 3 = 5x + 9$ $5x + 2 = 5x + 9$ $-5x \quad -5x$ $2 \neq 9$ no solution

I can apply the properties of integer

$(2a^4b^5)^3 =$ $8a^{12}b^{15}$
$2^3a^{12}b^{15}$

$7x^5(6x^3) =$ $42x^8$

$(2x^4)^3(3x^5)^2 =$ $72x^{22}$
$2^3x^{12} \cdot 3^2x^{10}$

$4a^7b(-3a^2b^5) =$ $-12a^9b^6$

$\frac{x^5y^5}{x^9y^2} =$ $\frac{y^3}{x^4}$

$\frac{18a^3b^{10}}{22a^6b^7} =$ $\frac{9b^3}{11a^3}$

$\left(\frac{-12a^2b^6c^4d^8e^3}{20a^3b^4cd^8e^7}\right)^0 =$ 1

$\frac{a^2}{a^4} =$ $\frac{1}{a^2}$

$(a^2b)^3 =$ a^6b^3

R/I numbers

EVALUATE or ESTIMATE the following square roots and cube roots. Estimate to the nearest tenth, if necessary.

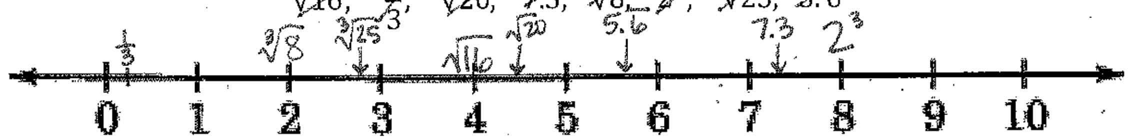
$\sqrt{16} =$ 4 $\sqrt{8} \approx$ 2.8 $\sqrt[3]{64} =$ 4 $\sqrt[3]{30} \approx$ 3.1 $\sqrt{144} =$ 12

Match each number on the left to the equivalent number on the right.

$0.\overline{1}$	$\frac{6}{25}$
$\frac{3}{8}$	$0.\overline{18}$
0.24	$\frac{1}{9}$
$\frac{2}{11}$	0.375

Place the following numbers on the number line in the appropriate place.

$\sqrt{16}$, $\frac{1}{3}$, $\sqrt{20}$, 7.3, $\sqrt[3]{8}$, 2^3, $\sqrt[3]{25}$, 5.6



Scientific Notation

Convert the following numbers either from scientific notation to standard or from standard to scientific notation.

$0.000000000524 =$ 5.24×10^{-10}

$70{,}600{,}000{,}000{,}000 =$ 7.06×10^{13}

$1.02 \times 10^{-7} =$ 0.000000102

$9.5 \times 10^5 =$ $950{,}000$

Correctly write each of the following numbers in scientific notation. Hint: What must be true about the coefficient?

$0.13 \times 10^{-2} =$ 1.3×10^{-3}

$30.4 \times 10^3 =$ 3.04×10^4

Solve the following problems and be sure that your answer is written in CORRECT scientific notation.

$(2.3 \times 10^{-3})(3.4 \times 10^2) =$ 7.82×10^{-1}

$\frac{3.6 \times 10^5}{1.2 \times 10^{-3}} =$ 3.0×10^8

$(4.1 \times 10^8)(5.3 \times 10^4) =$ 2.173×10^{13}
21.73×10^{12}

Transformations

1. Which of the following statements are true of a figure translated -5 on the y axis?
   a. ~~The angles become smaller~~
   b. ~~The figure would be larger~~
   c. The size and shape would remain the same
   d. ~~The shape would remain, but the size would change~~

2. Which of the following transformations would result in a figure that is similar to the original figure?
   a. (4x, y) b. (x-2, y+4) c. (4x, 4y) d. (x+2, y)
3. Using the coordinates, D(6,2), E(2,2) and F(3,4) what would the new coordinates be if:
   a. You translated -5 units vertically? D' (6,-3) E' (2,-3) F' (3,-1)
   b. You reflected over the x axis? D' (-6,2) E' (-2,2) F' (-3,4)
   c. You reflected over the y axis? D' (6,-2) E' (2,-2) F' (3,-4)
4. Describe the transformations or sequences of transformations that occurred.
   a. (3x, 3y)

      dilation with a scale factor of 3
   b. (½ x – 4, ½ y + 2)

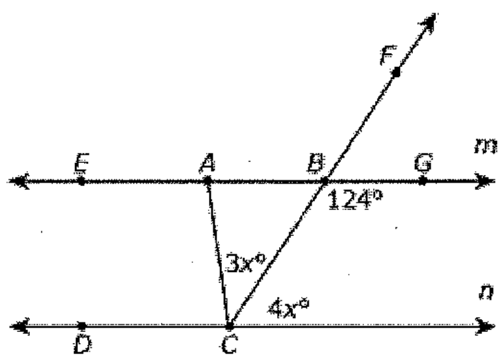
      dilation with scale factor of $\frac{1}{2}$; horizontal translation -4 vertical translation +2
5. Would the figures be similar or congruent?
   a. A reflection over the x axis followed by a dilation with a scale factor of 2.

      similar
   b. A rotation clockwise 90° and a reflection over the y axis.

      congruent

Angles

Parallel lines *m* and *n* intersect line segment *AC* and ray *CB* .



Use the information in the diagram to answer the questions.

Part A

What are the degree measures of ∠*ABF* and ∠*GBF*? Explain your answers.

∠ABF = 124° because it is vertical to ∠GBC

∠GBF = 56° because it is supplementary to ∠ABF.

(124 + 56 = 180)

Part B

What is the measure of ∠*ACD*? Show or explain how you got your answer.

$4x = 56$ (alternate interiors)

$\frac{4x}{4} = \frac{56}{4}$

$x = 14$, so $\angle BCA = 3(14) = 42°$

$x + 42 + 56 = 180$ (supplementary)

$x + 98 = 180$

$-98 \quad -98$

$x = 82° = \angle ACD$