

This work will be collected on the first day of class. Work must be shown.

The following equations are assumed to be part of your general mathematics knowledge. You are also expected to be able to know when and how to use each equation.

Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Equation of a line	$y = mx + b$ (slope-intercept form) $y - y_1 = m(x - x_1)$ (point-slope form) $Ax + By = C$ (standard form)
Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where $ax^2 + bx + c = 0$
Pythagorean theorem	$a^2 + b^2 = c^2$ where c is the hypotenuse and a and b are the sides of a right triangle
Distance formula	$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
Midpoint formula	$x = \frac{x_1 + x_2}{2}, y = \frac{y_1 + y_2}{2}$

On graph paper, carefully draw the graphs of the following; make sure to label the axes.

1.	a) $y = -2x + 1$	b) $y = \frac{2}{3}x - 4$	c) $y = x$	d) $y = -3$	e) $x = 2$
2.	a) $y = x^2$	b) $y = x^2 - 1$	c) $y = 2x^2$	d) $y = -2x^2$	e) $y = \frac{2}{3}x^2$
3.	a) $y = x^3$	b) $y = x^3 - 1$	c) $y = 2x^3$	d) $y = -2x^3$	e) $y = \frac{2}{3}x^3$
4.	a) $y = x $	b) $y = x + 1$	c) $y = -2x $	d) $y = -2 x $	
5.	a) $y = 2^x$	b) $y = 3^x$	c) $y = 2^{-x}$	d) $y = 2^{x+2}$	e) $y = \left(\frac{1}{3}\right)^x$
6.	a) $y = \log_2 x$	b) $y = \log_2(x - 2)$	c) $y = \frac{1}{2} \log_2 x$	d) $y = \log_2 x - 3$	e) $y = \log_3 x$

NOTE: parallel lines have the same slope, perpendicular lines have slopes that are negative reciprocals

- A polygon has vertices at $(-3, 6)$, $(-5, 3)$, $(-3, 0)$, and $(-1, 3)$. Sketch the polygon if all the vertices are shifted 3 units down and 6 units to the right. Using the slope and distance formulas determine the type of polygon sketched.
- A triangle has vertices at $(4, 0)$, $(2, 1)$, and $(-1, -5)$. Using the slope and distance formulas classify the triangle by both sides and angles.
- A triangle has vertices at $(1, -3)$, $(3, 2)$, and $(-2, 4)$. Using the slope and distance formulas classify the triangle by both sides and angles.

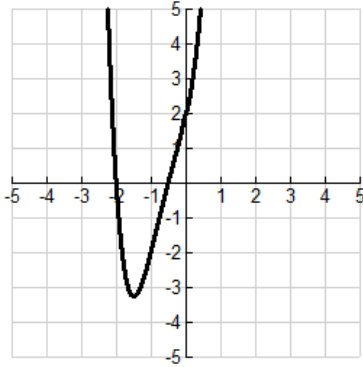
10. Find the midpoint between each of the following pairs of points.

a. $(-1, 2), (5, 4)$ b. $\left(\frac{1}{2}, 1\right), \left(-\frac{5}{2}, \frac{4}{3}\right)$

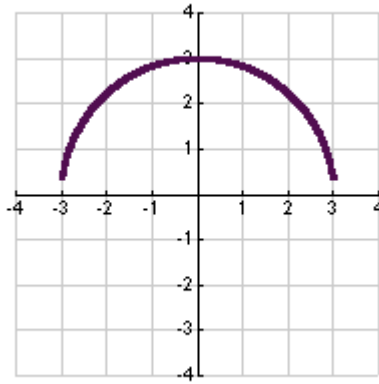
11. Match each of the graphs with its equation.

a. $y = 2x^4 + 5x^3 + 4x^2 + 5x + 2$ b. $y = -\log_3(x + 2)$ c. $y = \sqrt{9 - x^2}$
 d. $y = 2\sqrt{x}$ e. $y = x^3 - x + 1$ f. $y = |x| - 3$

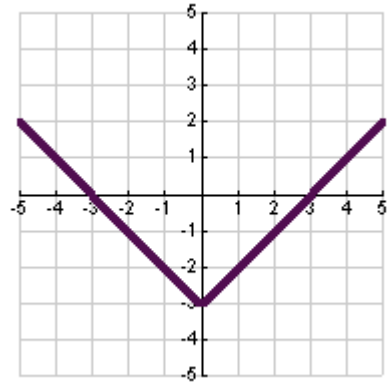
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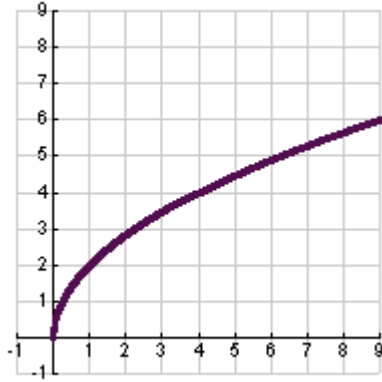
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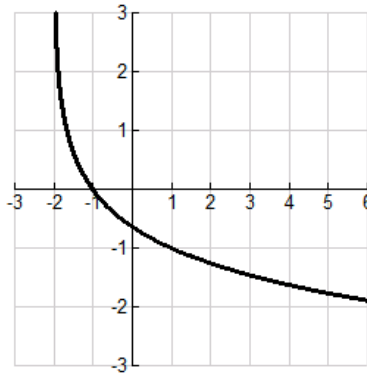
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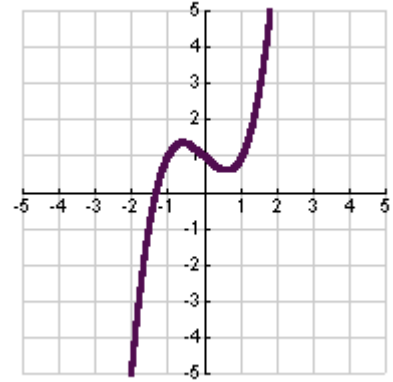
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V



VI



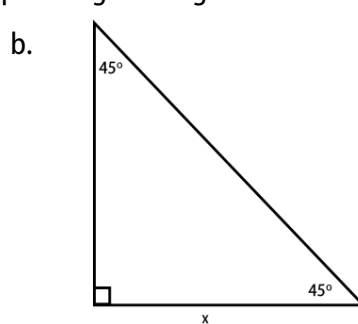
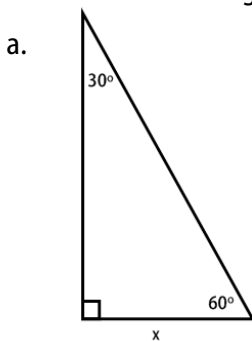
12. Find the standard equation of the line that
- has slope 3 and passes through $(0, -2)$
 - has undefined slope and passes through $(6, -1)$
 - has slope 0 and passes through $(-10, 4)$
 - has slope -3 and passes through $\left(-\frac{1}{2}, \frac{3}{2}\right)$
 - passes through $\left(\frac{3}{4}, \frac{3}{2}\right)$ and $\left(-\frac{4}{3}, \frac{7}{4}\right)$
 - has x-intercept $(2, 0)$ and y-intercept $(0, 3)$
 - passes through $(2, 1)$ and is parallel to $4x - 2y = 3$
 - passes through $(2, 1)$ and is perpendicular to $4x - 2y = 3$

13. Find the intersection of the two equations.

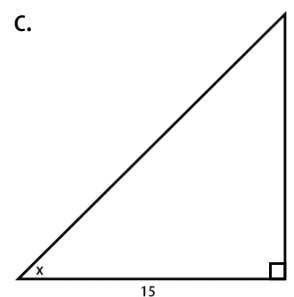
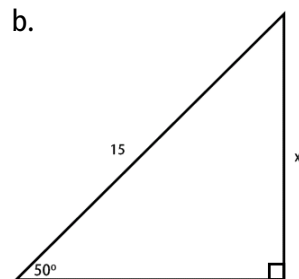
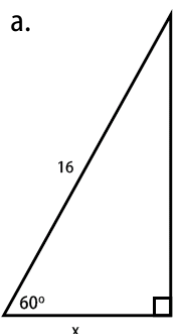
a. $3x + 5y = -7$
 $-x - 2y = 3$

b. $x^2 + 2y = 14$
 $3x + 4y = 1$

14. Fill in the missing sides of each special right triangle.



15. Solve the right triangle for x .



16. Find ALL solutions (real and imaginary) to the following problems.

a. $1200 = 300 + 2(x - 500)$

b. $\frac{3x}{2} + \frac{1}{4}(x - 2) = 10$

c. $\frac{2x}{3} = 10 - \frac{24}{x}$

d. $\frac{6}{x} + \frac{8}{x+5} = 3$

e. $\frac{3}{x+2} - \frac{4}{x-2} = 5$

f. $\left(\frac{1}{4}\right)^x = 64$

g. $2^{3-x} = 565$

h. $(x+1)^2 + 2(x-2) = (x+1)(x-2)$

i. $2x^3 - x^2 - 18x + 9 = 0$

j. $x^4 = 2x^2 - 1$

k. $6x^2 + 3x = 0$

l. $9x^2 = 25$

m. $(2x - 1)^2 = 18$

n. $(x+5)^2 = (x+4)^2$

o. $2x^4 + 5x^3 + 4x^2 + 5x + 2 = 0$

p. $9x^2 - 6x - 35 = 0$

q. $|2x - 1| = 5$

r. $|x| = x^2 + x - 3$

s. $\log 8x - \log(1 + \sqrt{x}) = 2$

t. $\ln x - \ln 5 = 0$

u. $\sqrt{x+1} - 3x = 1$

v. $\sqrt{x} - \sqrt{x-5} = 1$

w. $\sqrt{2x+3} + \sqrt{x-2} = 2$

x. $(x-1)^{\frac{2}{3}} - 25 = 0$

17. Solve the following inequalities.

a. $-2 < 3x + 1 < 10$

b. $-8 \leq 1 - 3(x - 2) < 2$

c. $-4 < \frac{2x-3}{3} < 4$

d. $|x - 7| > 6$

e. $|1 - 2x| < 5$

f. $(x+6)^2 \leq 8$

g. $x^2 - 6x + 9 < 16$

h. $x^3 - 4x \geq 0$

i. $x^4(x-3) \leq 0$