Math 3(X) Summer Refresh

Use KHAN ACADEMY as a resource to access tutorials and more practice on each topic.
https://www.khanacademy.org/math/algebra2

Linear Functions and Systems: Writing and Solving

1. Sophie buys lunch for her co-workers on Fridays. Last week she bought 8 tacos and 5 burritos and spent $30.25. This week, she bought 10 tacos and 3 burritos, and spent $27.25. How much is each taco? How much for each burrito?

Solve each system of equations using the substitution method.

1. $2x + y = 4$
$3x + 2y = 1$

2. $x - 9 = 3y$
$x + 2y = -1$

Solve each system of equations using the elimination method.

4. $2x + y = 1$
$3x - y = 14$

5. $2x - y = -1$
$3x + 2y = 30$

Solve each system of equations. (Use either algebraic method.)

6. $6x + 3y = 6$
$8x + 5y = 12$

7. $\frac{3x - y}{2} = 5$
$\frac{4x - y}{4} = 4$

Quadratic Functions: Solving and Graphing

1. An emergency signal flare is launched off the deck of a disabled cargo ship, with the path of the flare given by the function: $h(t) = -16t^2 + 480t + 80$, where 't' is the time in seconds and h(t) is the height of the flare in feet.

   a. How high is the flare before it is launched?

   b. How high is the flare 8 seconds after it is launched?

   c. What is the MAXIMUM height of the flare?

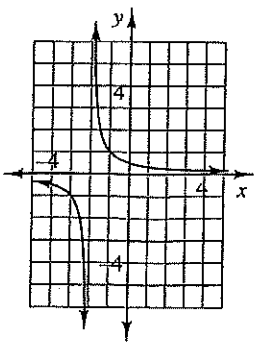
   d. When does the flare hit the water surface?

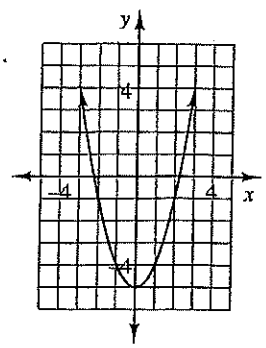
Determine the x-intercepts of each parabola using any method.

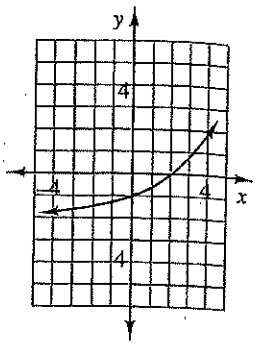
1. $0 = x^2 - 10x$
2. $0 = x^2 + 3x - 4$
3. $0 = x^2 + 7x + 2$
4. $0 = x^2 + \frac{1}{5}x$
5. $0 = 2x^2 - 4x + 4$
6. $x^2 - 0.6x + 0.09 = 0$
7. $2x^2 - 3x - 5 = 0$
8. $3x^2 + 9x + 6 = 0$
9. $x^2 - 8x + 16 = 0$
10. $x^2 + 14x + 24 = 0$
11. $x^2 - 12x = 13$
12. $x^2 - 9x = -27$
13. $x^2 = -x + 20$
14. $4x^2 - 2x - 30 = 0$
15. $-20x^2 - 7x = -6$
16. $x^2 = -x - 13$
17. $5x^2 = -3x - \frac{1}{4}$
18. $x^2 - \frac{1}{4}x = 0$
19. $100x^2 + 200x + 100 = 0$
20. $6x^2 + 2 = -12x$

Functions and Function Notation: Writing, Evaluating and Solving Functions; Translations and Transformations of Functions

Describe each graph using the PARENT FUNCTION, x-INTERCEPTS, y-INTERCEPTS, DOMAIN and RANGE:

1. 

2. 

3. 

4. Graph and completely describe the function $y = x^{1/3}$.

Calculate each value or expression in problems 5 through 10.

5. If $f(x) = 3 - x^2$, calculate $f(5)$ and $f(3a)$.

6. If $g(x) = 5 - 3x^2$, calculate $g(-2)$ and $g(a + 2)$.

7. If $f(x) = \frac{x+3}{2x-5}$, calculate $f(2)$ and $f(2.5)$.

8. If $f(x) = x^2 + 5x + 6$, solve $f(x) = 0$.

9. If $g(x) = 3(x - 5)^2$, solve $g(x) = 27$.

10. If $f(x) = (x + 2)^2$, solve $f(x) = 27$.

Rules of Exponents: Simplifying and Operations

1. x^{-5}	2. m^0	3. 4^{-1}	4. $\sqrt[3]{y}$
5. $\frac{1}{c^4}$	6. $\frac{1}{b^{-2}}$	7. $12^{1/12}$	8. $z^{-3/4}$
9. $\frac{1}{(\sqrt[6]{7})^5}$	10. 0^0	11. $9^{1/2}$	12. $\sqrt[5]{a^3}$

For problems 13 through 24, rewrite each expression with no parentheses and no negative exponents.

13. $(f^3)\sqrt[3]{f^3}$	14. $\left(\frac{1}{27}\right)^{-1/3}$	15. $(v^2g^{3/4})^8$	16. $\left(\frac{1}{q^6}\right)^7$
17. $d^{-9}d^{-4}$	18. $(3xw^4)^{-2}$	19. $(u^3r^{-4})^{-2}$	20. $n^3(n^2)^5$
21. $4(\sqrt{4})^4$	22. $6(k^{1/2}t^5)^2$	23. $p^{15}p^{-15}$	24. $h^8s^{12}(\sqrt[8]{h})(s^{1/4})$

For problems 25 through 27, solve each equation for x.

25. $x^{1/4} = 2$	26. $81^x = \frac{1}{27}$	27. $9^{4+x} = 27^{8/x}$

Exponential Growth and Decay

A population of 1870 hummingbirds is decreasing by 4% each year.

1. Write a function for the hummingbird population.

2. How many hummingbirds will there be in the population in 8 years?

3. When will the population be reduced to HALF the starting value?

A pharmaceutical stock valued at $89 per share is increasing by 3.75% every year.

1. Write a function for the stock value.

2. What will the stock share price be in 5 years?

3. The stock will SPLIT when the share price DOUBLES in value. When will the stock SPLIT?

Probability and Statistics

Box and Whisker Plots

The following chart gives the number of motorcycle fatalities in the United States by state and federal district in a recent year.

AL	39	FL	235	LA	45	NE	31	OK	46	VT	12
AK	1	GA	63	ME	21	NV	22	OR	70	VA	56
AZ	91	HI	13	MD	65	NH	24	PA	150	WA	90
AR	50	ID	27	MA	62	NJ	49	RI	18	WV	27
CA	767	IL	174	MI	105	NM	37	SC	56	WI	88
CO	62	IN	131	MN	54	NY	181	SD	14	WY	5
CT	65	IA	57	MS	30	NC	91	TN	83		
DE	14	KS	42	MO	60	ND	7	TX	297		
DC	4	KY	40	MT	26	OH	199	UT	30		

1. Make a box-and-whisker plot of the data.

2. Identify any outliers.

The Normal Distribution

The weights of eggs produced on a farm are normally distributed with a mean of 1.4 ounces and a standard deviation of 0.4 ounces.

1. What percent of the eggs weigh at least 1 ounce?

2. How many of 1200 eggs are within 2 standard deviations of the mean?

3. To be graded extra large, an egg must weigh at least 2.2 ounces. What is the probability that an egg from this farm will be graded extra large?