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Lesson 5: Declaring Independence

Solidify Understanding

Ready

Find the x-intercepts, y-intercept, line of symmetry, and vertex for the quadratic functions, and then graph them on the coordinate grid.

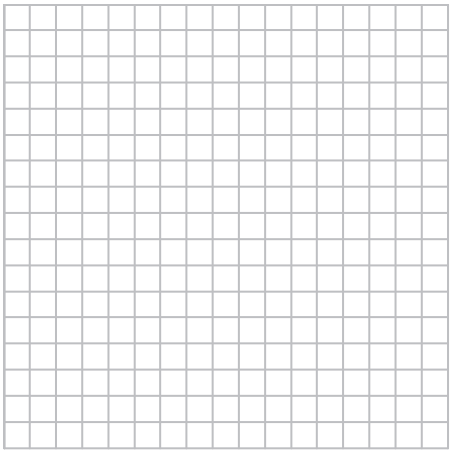
1. $f(x) = x^2 + 8x - 9$

x-intercepts:

y-intercept:

line of symmetry:

vertex:



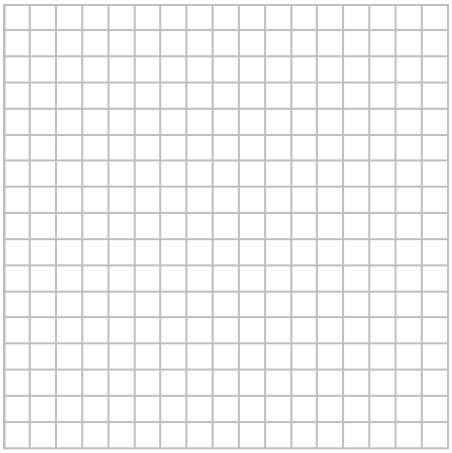
2. $g(x) = x^2 - 3x - 5$

x-intercepts:

y-intercept:

line of symmetry:

vertex:



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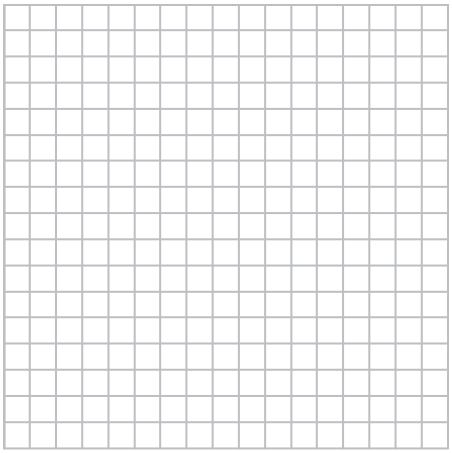
3. $h(x) = 2x^2 + 5x - 3$

x-intercepts:

y-intercept:

line of symmetry:

vertex:



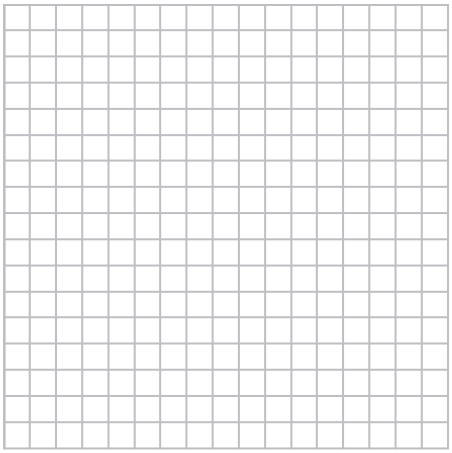
4. $k(x) = x^2 - 6x + 9$

x-intercepts:

y-intercept:

line of symmetry:

vertex:



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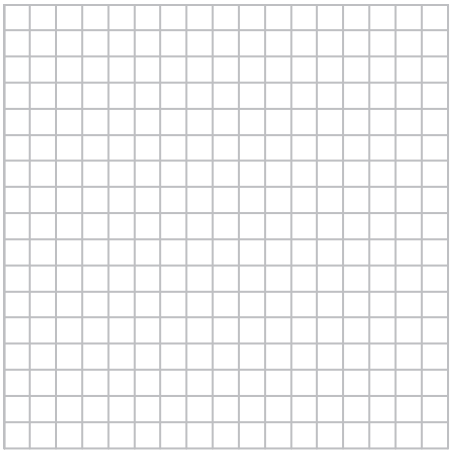
5. $p(x) = (x+5)^2 - 2$

x-intercepts:

y-intercept:

line of symmetry:

vertex:



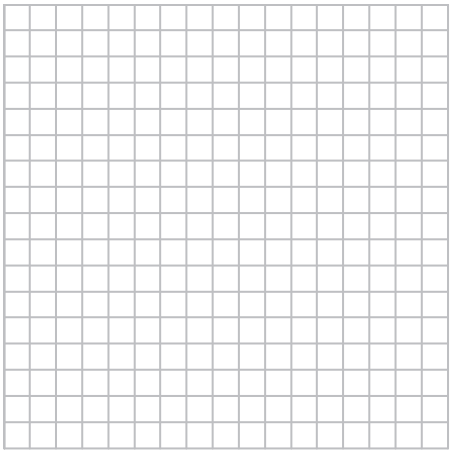
6. $q(x) = (x+7)(x-5)$

x-intercepts:

y-intercept:

line of symmetry:

vertex:



Set

Determining the independence of events can sometimes be done by becoming familiar with the context in which the events occur and the nature of the events. There are also some ways of determining independence of events based on equivalent probabilities.

- Two events, A and B, are independent if $P(A \text{ and } B) = P(A) \cdot P(B)$.
- Additionally, two events, A and B, are independent if $P(A|B) = \frac{P(A \text{ and } B)}{P(B)} = P(A)$.

Use these two ways of determining independent events to determine independence in the

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problems below and answer the problems.

7. $P(A \text{ and } B) = \frac{3}{5}$

$P(A) = \frac{1}{2}$

$P(B) = \frac{3}{10}$

8. $P(A) = \frac{1}{5}$

$P(A \text{ and } B) = \frac{1}{6}$

$P(B) = \frac{1}{3}$

9. $P(A) = \frac{1}{2}$

$P(A \text{ and } B) = \frac{1}{5}$

$P(B) = \frac{2}{5}$

10. $P(A \text{ and } B) = \frac{2}{5}$

$P(A) = \frac{1}{4}$

$P(B) = \frac{4}{5}$

The table shows the results of a survey of automobile preferences for different age groups. Participants were asked whether they would prefer owning a car or a truck. Use the table for problems 11–15.

	Truck	Car	Total
16–35	10	40	50
36–55	40	160	200
Total	50	200	250

11. Find $P(\text{Truck}|\text{Age Range 16–35})$.

12. Find $P(\text{Age Range 16–35}|\text{Truck})$.

13. Find $P(\text{Truck})$.

14. Find $P(\text{Age Range 16–35})$.

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15. Based on the random survey, are preferring a truck and belonging to the age range of 16–35 years old independent or dependent events? Provide justification.

Go

The following data represents the number of men and women passengers aboard the *Titanic* and whether or not they survived.

	Survived	Did Not Survive	Total
Men	146	659	805
Women	296	106	402
Total	442	765	1,207

16. $P(w) =$

17. $P(s) =$

18. $P(s|w) =$

19. $P(w \text{ or } s) =$

20. $P(w \text{ or } m) =$

21. $P(ns|w) =$

22. $P(m \text{ and } ns) =$