Name: _____ Date: _____

Chapter 5 Prerequisite Skills

Use the Cosine Law

1. A circle with a diameter of 16 cm has points on its circumference every 45°.
- **a)** Find the distance between two adjacent points.
- **b)** Find the distance between two points separated by 90°.
- **c)** Find the distance between two points separated by 135°.
- **d)** Find the distance between two points separated by 270°.
- **e)** What do you notice about your answers to parts b) and d)? Explain.

Find Trigonometric Ratios of Special Angles

2. Find exact expressions for the three primary trigonometric ratios for each angle given.
- **a)** 60°
- **b)** 135°
- **c)** 210°
- **d)** 330°

Determine the Domain and Range of a Function

3. Write the domain and range for the function $y = \sqrt{x-1}$, using set notation.

4. Write the equation of a function with domain $\{x \in \mathbb{R}\}$ and range $\{y \in \mathbb{R}, y \leq -2\}$.

Shift Functions

5. a) Graph the following three functions on the same set of axes.
- **i)** $y = x^2$
- **ii)** $y = x^2 + 1$
- **iii)** $y = x^2 - 5$

b) Describe the transformations of the last two functions with respect to the first.

6. a) Graph the following three functions on the same set of axes.
- **i)** $y = x^2$
- **ii)** $y = (x - 2)^2$
- **iii)** $y = (x + 1)^2$

b) Describe the transformations of the last two functions with respect to the first.

7. The parabola $y = x^2$ is translated 3 units to the left and 6 units up. Write the equation of the transformed function.

8. The parabola $y = x^2$ is translated vertically and horizontally so that its vertex passes through (3, –4).
- **a)** Find the equation of the parabola after the translation.
- **b)** Describe each of the translations.

Stretch Functions Vertically and Horizontally

9. a) Graph the following three functions on the same set of axes.
- **i)** $y = x^2$
- **ii)** $y = 3x^2$
- **iii)** $y = \frac{1}{3}x^2$

b) Describe the transformations of the last two functions with respect to the first.

10. a) Graph the following three functions on the same set of axes.
- **i)** $y = (x - 1)^2$
- **ii)** $y = 3(x - 1)^2$
- **iii)** $y = \frac{1}{3}(x - 1)^2$

b) Describe the transformations of the last two functions with respect to the first.

11. The parabola $y = x^2$ is stretched so that it passes through the point (4, 8). What is the equation of the stretched parabola?

12. The parabola $y = (x - 1)^2$ is stretched so that it passes through the point (5, 32). What is the equation of the stretched parabola?

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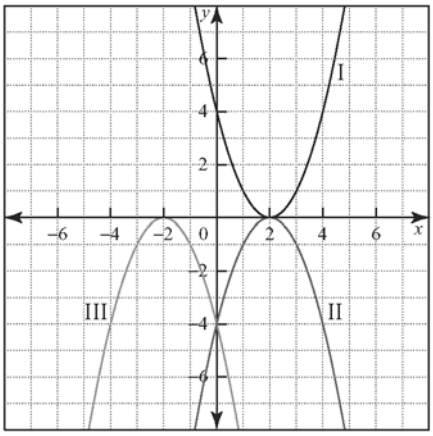
Reflect Functions

13. a) Graph the following two functions on the same set of axes.
i) $y = (x - 1)^2$
ii) $y = -(x - 1)^2$
b) Describe the transformation of the second function with respect to the first.

14. Consider the graph shown.



a) Determine the equation for each of the functions shown.
b) How are the equations of graphs I and II related?
c) How are the equations of graphs II and III related?
d) Use this information to explain how the equations of graphs I and III are related.

Combine Transformations

15. a) The graph of $y = x^2$ is translated 2 units to the right, stretched by a factor of 2, and then shifted 3 units down. Determine the equation of the resulting parabola.
b) Graph $y = x^2$ and the transformed function from part a) on the same set of axes.

16. Describe the transformations applied to $y = x^2$ to produce the graph of $y = -\frac{1}{3}(x + 1)^2 - 3$.

Solve Equations Involving Rational Expressions

17. Solve.
a) $\frac{360}{k} = 45$
b) $\frac{360}{k} = 60$

18. Solve.
a) $\frac{360}{k} = \frac{1}{45}$
b) $\frac{360}{k} = \frac{1}{60}$

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