


SUMMER MATH PACKET FOR STUDENTS RISING TO PRECALCULUS

Provided by Cox Math Tutoring

Directions: Complete the following problems without the use of a calculator, unless the problem is accompanied by

a calculator icon: .

1. Evaluate each of the following expressions.

1.1. $\frac{3}{16} + \frac{1}{8}$

1.2. $\frac{5}{8} - \frac{5}{12} + \frac{1}{6}$

1.3. $\frac{4}{5} \cdot \frac{1}{2} \cdot \frac{3}{4}$

1.4. $\frac{27-35}{4}$

1.5. $\frac{\frac{1}{5}(-8-9)}{\frac{-1}{3}}$

1.6. $5^{-1} + 2^{-3}$

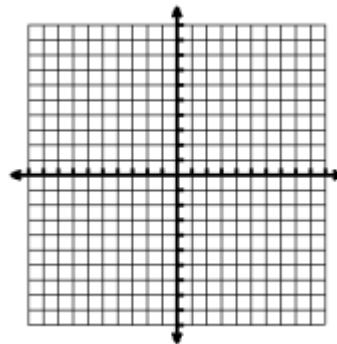
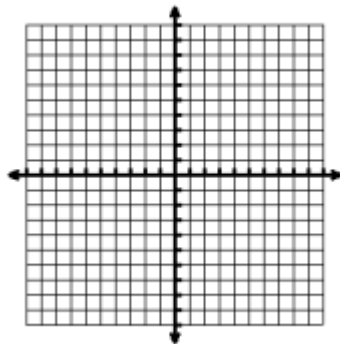
1.7. $\left(\frac{3}{2}\right)^{-2} - 2^2$

1.8. $-3 + \frac{3}{7}$

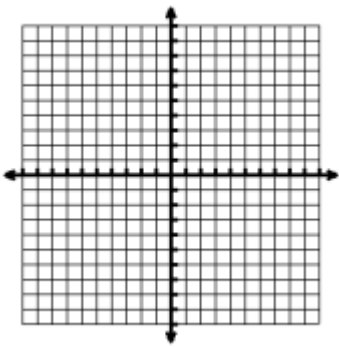
2. Graph each equation.

2.1. $y = -3x + 2$

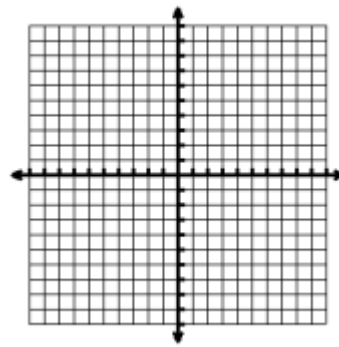
2.2. $x - 2y = 6$



2.3 $y = \sqrt{x}$



2.4 $y = x^2$



3. Describe the transformations in the graphs from the parent function $f(x) = x^2$

3.1. $g(x) = -(x + 4)^2 - 3$

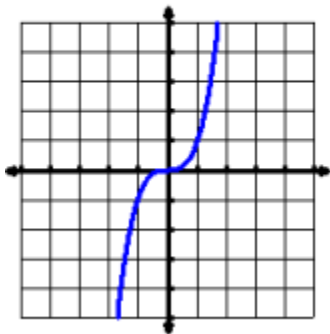
3.2. $h(x) = 2(x - 1)^2 + 6$

3.3. $m(x) = 3 - (x + 2)^2$

4. Give the domain and range of the following in interval notation.

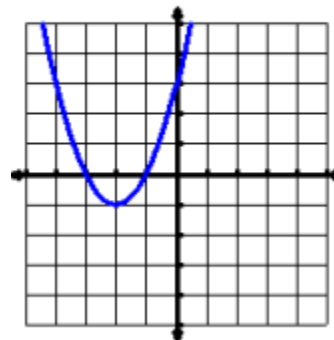
4.1

D: _____
R: _____

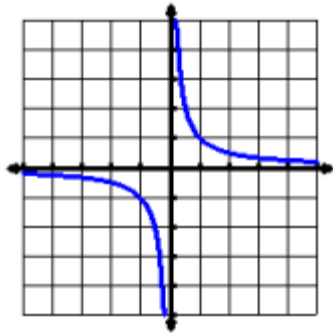


4.2

D: _____
R: _____

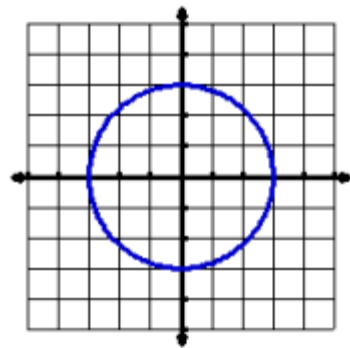


. D: _____
R: _____



4.3

. D: _____
R: _____



4.4

5. Factor completely.

5.1. $x^3 - 7x^2 + 6x$

5.2. $3x^2 - 75$

5.3. $-8x^3 + 40xy + 112y^2$

5.4. $x^3 - 27$

5.5. $16x^2 - 24x + 9$

6. Solve by factoring.

6.1. $x^2 - 49 = 0$

6.2. $6x^2 - 10x = 4$

6.3. $5x^2 - 37x + 14 = 0$

6.4. $90x^4 - 10x^2 = 0$

7. Solve by either the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ or completing the square.

7.1. $3x^2 + x - 1 = 0$

7.2. $5x^2 + 8x = -12$

8. Use the properties of exponents to simplify the following expressions.

8.1. $(2y)(4xy^{-3})$

8.2. $\frac{18a^2bc^3}{36ab^3c}$

8.3. $\left(\frac{3}{5}c^2f\right)\left(\frac{4}{3}cd\right)^2$

8.4. $\frac{(2xy^{-1}z^2)^2}{(3x^{-2}y^5z^{-3})^2}$

9. Write the following in simplest radical form (your answer should not contain decimals).

9.1. $-\sqrt{175}$

9.2. $\frac{\sqrt{8x^2}}{\sqrt{2x}}$

9.3. $\sqrt{27} + \sqrt{108}$

9.4. $(\sqrt{8} + \sqrt{12})^2$

9.5. $\sqrt[3]{x^2y^4} \cdot \sqrt[3]{x^5}$

9.6. $\frac{1}{3+\sqrt{5}}$

10. Write the following complex numbers in simplest form.

10.1. $\sqrt{-64x^{12}}$

10.4. $(7 - 4i) - (-3 + 6i)$

10.2. i^6

10.5. $(3 + 4i)(5 - 2i)$

10.3. $\frac{4-3i}{1+2i}$

11. Find the reference angle for each of the following angles.

11.1. -230°

11.4. $-\frac{11\pi}{4}$

11.2. 120°

11.3. $\frac{3\pi}{5}$

12. A point on a terminal side of an angle θ in standard position is given. Find the exact value of each of the trigonometric functions of θ .

12.1. $(-3, 4)$

12.2. $(5, -12)$

13. Name the quadrant in which the angle lies.

13.1. $\sin\theta > 0, \cos\theta < 0$

13.2. $\cos\theta > 0, \cot\theta < 0$

14. Find the exact value of the remaining five trigonometric functions of θ .

14.1. $\sin\theta = \frac{-5}{13}, \theta$ in quadrant III

14.2. $\cos\theta = \frac{-1}{4}, \tan\theta > 0$

15. Sketch the graph of the following functions.

15.1. $y = 4\cos(x)$

15.2. $y = \sin(3x)$

16. Sketch a right triangle and solve each of the following.

16.1. The hypotenuse of a right triangle is 5 inches.
If one leg is 2 inches, find the degree measure of each angle.

16.2. At 10 A.M. a building 300 ft. high cast a shadow 50 ft. long.
What was the elevation of the sun.