

SHOW NECESSARY WORK ON THE TEST COPY
PLACE YOUR ANSWERS IN THE BLANKS PROVIDED
THERE ARE 125 POINTS POSSIBLE

Answers  (Points)

1. Solve each of the following.

a) $-2x^3 + 20x^2 - 48x = 0$ (Begin by factoring.)

1.
a) $x = \underline{\hspace{2cm}}$ (4)

b) $(x + 7)^2 = 16$ (Apply the Square Root Property.)

b) $x = \underline{\hspace{2cm}}$ (4)

c) $x^2 - 2x - 8 = 4$

c) $x = \underline{\hspace{2cm}}$ (4)

d) $\sqrt{10x+24}=x$

d) $x = \underline{\hspace{2cm}}$ (5)

e) $x^4 + x^2 - 12 = 0$

e) $x = \underline{\hspace{2cm}}$ (5)

f) $1 - \frac{4}{x+6} = \frac{4}{x}$

f) $x = \underline{\hspace{2cm}}$ (5)

2. Simplify the following expressions:

a) $\sqrt[3]{-54x^{12}y^8}$

2.
a) _____(2)

b) $\frac{2\sqrt{6}}{5-\sqrt{3}}$

b) _____(2)

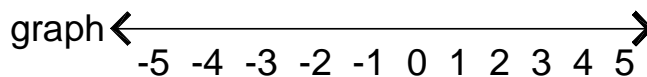
c) $\left(\frac{64x^{4/3}}{x^{-2/3}}\right)^{1/2}$

c) _____(2)

3. Solve the following inequality. Graph the solution set and write it in interval notation. [5 points]

$$\frac{x+1}{x-3} \leq 0$$

Interval notation _____



4. Write answers in a + bi form.

a) Multiply and simplify: $(5 + 4i)(2 + 3i)$

4.
a) _____(2)

b) Divide and simplify: $\frac{8-4i}{2i}$

b) _____(2)

5. Given $f(x) = \frac{2x+5}{3}$, find the inverse function, $f^{-1}(x)$

5. _____(4)

Answers  (Pts)

6. Find the center and radius of the circle, $x^2 + y^2 + 6x - 8y - 11 = 0$

6. (4)

center = _____

radius = _____

7. Graph the parabola, $y = -x^2 + 6x - 8$. Also find:

a) the vertex.

a) vertex _____(2)

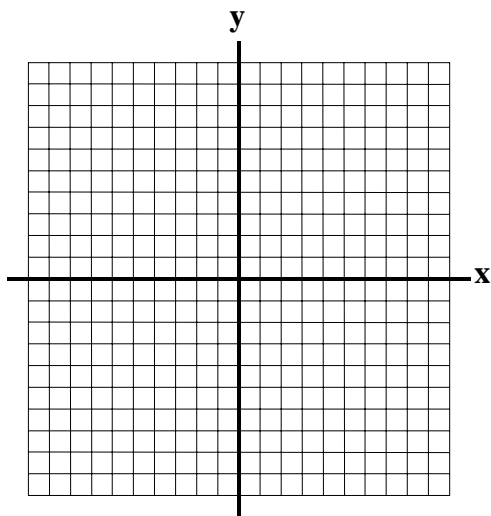
b) the x-intercept(s), if any.

b) x-intercept(s) _____(2)

c) the y-intercept(s), if any.

c) y-intercept(s) _____(1)

Graph. (2)

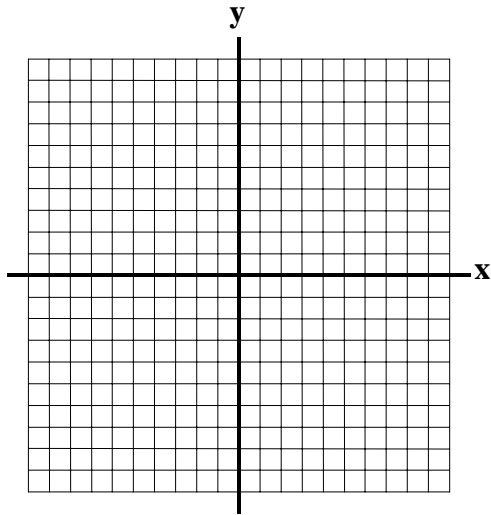


8. Identify each equation as that of either an ellipse, a parabola, a circle or a hyperbola. Then graph on the given grids.

a) $16x^2 + 36y^2 = 144$

b) $x^2 - 9y^2 = 36$

a) Graph. (3)

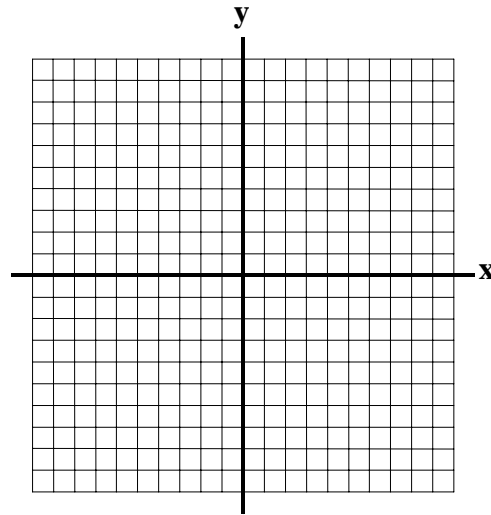


8.

a) type _____(1)

b) type _____(1)

b) Graph. (3)



9. Solve.

a) $\log_2(x + 6) + \log_2x = 4$

9.

a) _____(4)

b) $6^x = 50$ (Give the exact answer and an approximation accurate to three decimal places.)

b) Exact _____(3)

Approx. _____(1)

10. Write as an exponential equation: $\log_6 7776 = 5$

10. _____(2)

11. Evaluate:

a) $9^{-3/2}$

11.
a) _____(2)

b) $\log_3 1 - \log_3 81$

b) _____(2)

12. If \$4000 is put into an account paying 3.2% interest compounded continuously, how long will it take for the account to be worth \$6000? (Use $P=e^{rt}$.)

12. _____(4)

13. Simplify:

a) $\frac{5}{x-1} - \frac{3}{x}$

13.
a) _____(3)

b) $\frac{10x+20}{12y^4} \div \frac{x^2-4}{3xy-6y}$

b) _____(4)

c) $\frac{2 - \frac{6}{x}}{\frac{x}{9} - \frac{1}{x}}$

c) _____(4)

Answers  (Pts)

14. The foot of an 20-foot long ladder is placed 8 feet from the base of a vertical wall. How far up the wall will the ladder reach? Give the exact answer and an approximation accurate to one decimal place.

14.

Exact _____(4)

Approx. _____(1)

15. Suppose \$3000 is invested into an account paying 2.6% interest compounded quarterly. How much will the account be worth in 5 years? (Use $A = P(1 + \frac{r}{n})^m$ where A = accrued amount, P = principal, r = annual interest rate, t = number of years and n = number of times compounded annually.)

15. _____(5)

16. Working together Sonya and Julia can paint a room in 3 hours. Working alone it would take Julia 12 hours to paint the room. How long would it take Sonya to paint the room alone?

16.
Equation _____(2)

Solution _____(4)

17. Solve the given system:

a) $x + 2y + 3z = 13$
 $2x - y + z = 11$
 $x + y - 2z = -6$

17.

a) _____(5)

b) $x^2 + y^2 = 25$
 $x - y = 7$

b) _____(5)

18. The maximum weight that a rectangular beam with square cross sections can support varies directly with the cube of the width and inversely with the length of the beam. If a beam that is 4 inches wide and 60 inches long can support 5 tons, how much weight can a similar beam that is 3 inches wide and 72 inches long support?

18. _____(5)