

6. Solve the equation $x^3 - 2x^2 - 14x + 40 = 0$, given that one of the roots is -4.

A. $\{-4, -3 + i, -3 - i\}$

B. $\{-4, 3 + i, 3 - i\}$

C. $\{-4, 2, 5\}$

D. $\{-4, 1, 5\}$

7. Find the center and the radius of the circle with equation $x^2 + y^2 - 12x + 4y - 24 = 0$.

A. $(6, -2); 4$

B. $(-6, 2); 8$

C. $(6, -2); 8$

D. $(-6, 2); 4$

8. Express $\sqrt[3]{16} \cdot \sqrt[6]{2}$ in simplest radical form.

A. $2\sqrt{2}$

B. $\sqrt[3]{4}$

C. $\sqrt[6]{128}$

D. $\sqrt[9]{4}$

9. Suppose $f(x) = \frac{4}{x}$, $g(x) = 2x - 1$, and $h(x) = \sqrt{x}$. Find $g(f(3))$.

A. $\frac{28}{3}$

B. $\frac{11}{3}$

C. $\frac{5}{3}$

D. $\frac{4}{7}$

10. Find the inverse of $f(x) = \sqrt[3]{5 - 2x}$ if it exists. If $f(x)$ has no inverse function, say so.

A. $f^{-1}(x) = \frac{5-x^3}{2}$

B. $f^{-1}(x) = \frac{x^3-5}{2}$

C. $f^{-1}(x) = (5 - 2x)^3$

D. no inverse function

Solve and show all work. Circle final answers. (4pts. Each)

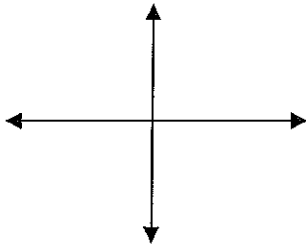
11. Use substitution to find the real solutions to the system: $x^2 + y^2 = 50$ and $y - x = 6$.

12. Solve: $\log_2(x - 3) + \log_2(x + 1) = 5$

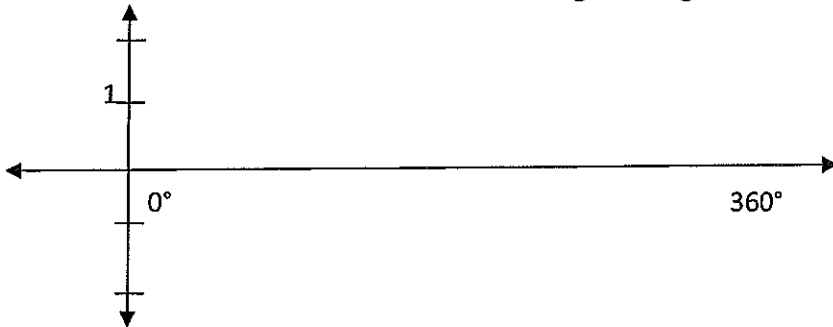
13. Show how to use logarithms to solve to three significant digits: $3.9^{4x} = 618$

TRIGONOMETRY:

14. Construct a reference triangle in the appropriate quadrant and find the $\sin\theta$ if $\cos\theta = -\frac{3}{5}$, and $0^\circ < \theta < 180^\circ$.



15. Graph the function $y = \sin\theta$ over the interval of $0^\circ \leq \theta \leq 360^\circ$. Approximate θ on your graph if $\sin\theta = -0.7034$ and $90^\circ < \theta < 270^\circ$. Then find θ to the nearest tenth degree using an inverse trig function.



16. Two ships sail from the same port in directions differing by 12.5° . After an hour the ships have traveled 10 km and 8.1 km, respectively. Diagram below and find how far the ships are apart to three significant digits.

17. Show how to change $\frac{7\pi}{4}$ radians into degrees. Then sketch the arc on a unit circle and find the exact $\sin\frac{7\pi}{4}$.