

NAME: _____

Mathematics Summer Packet

For incoming seniors taking the following course in September:

Calculus

- Completed packets will be collected on the first Monday of Academic week in September.
- Calculators may be used, but you must show your work to get full credit.
- This packet will count as a quiz grade for the first term of the upcoming school year.

Due on the 1st Monday of Academic Week in Sept.

Date _____ Period _____

Solve each equation.

1) $176 = 4(4 - 5n)$

2) $\frac{121}{12} = \frac{4}{3}x + 6x$

3) $13 - 4x = 1 - 2x$

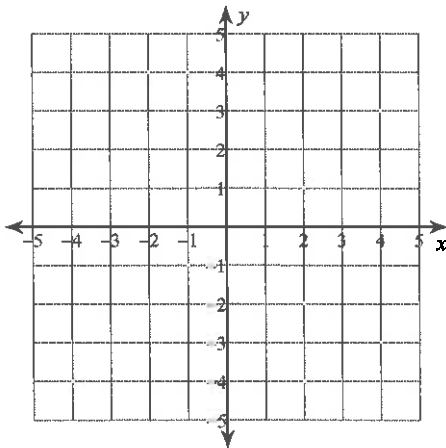
4) $4(3m - 5) = 6(m - 8) - m$

Solving Systems of Equations

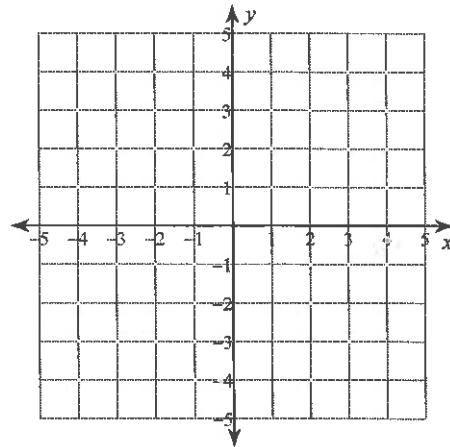
Solve each system by graphing.

5) $y = \frac{3}{4}x - 4$

$y = -\frac{3}{4}x + 2$



6) $x + 2y = -8$
 $5x - 2y = -4$



Solve each system of equations.

7) $9x + 9y = 27$
 $-x - 2y = 3$

8) $-3x + 8y = -17$
 $8x - 10y = 0$

Factoring and Solving Quadratics: Factor each completely.

9) $r^2 - 12r + 35$

10) $b^2 - 18b + 81$

11) $5x^2 + 3x - 8$

12) $2x^2 + x - 28$

13) $16r^2 - 9$

14) $x^2 + 10xy + 25y^2$

Solve each equation by factoring.

15) $k^2 - 35 = 2k$

16) $5x^2 + 42 = 41x$

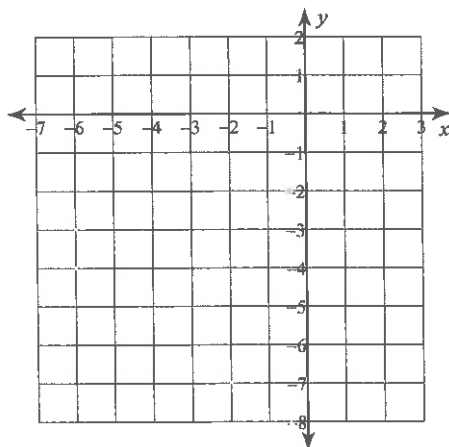
Solve each equation with the quadratic formula.

17) $3n^2 - 2n - 5 = 0$

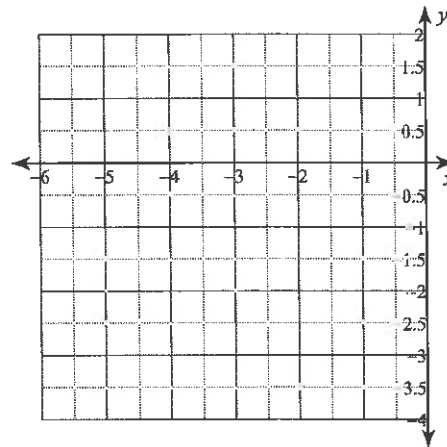
18) $8x^2 - 4x - 4 = 2$

Sketch the graph of each function. Identify roots and vertex.

19) $y = -2x^2 - 4x - 1$



20) $y = x^2 + 6x + 6$



Applying Exponent Properties: Simplify. Your answer should contain only positive exponents.

21) $yx^3 \cdot 2x^4$

22) $(3uv^2)^2$

23) $\frac{u^3v^3 \cdot uv^4}{(2v^3)^2}$

24) $\frac{3x^3y^4z^2}{4x^2z^3}$

25) $(3a^{-1}b^3)^{-2}$

26) $\frac{(2v^2)^{-3}}{(-2u^2v^{-4})^4}$

Function Operations: Evaluate each function.

27) $g(t) = t^2 + 5t$; Find $g(3)$

28) $w(t) = t^2 - t$; Find $w(z = 3)$

Perform the indicated operation.

29) $g(x) = 3x + 2$
 $h(x) = x^2 - 2x$
Find $(g - h)(x)$

30) $f(n) = 2n + 3$
 $g(n) = n^2 - 2n$
Find $(f \cdot g)(n)$

31) $f(n) = 4n - 2$
 $g(n) = -n^3 - 4n$
Find $(f \circ g)(n)$

32) $g(x) = x - 2$
 $f(x) = 3x - 5$
Find $(g \circ f)(x)$

$$33) \begin{aligned} f(a) &= 4a - 2 \\ g(a) &= a^3 + 4a \\ \text{Find } \left(\frac{f}{g}\right)(4) \end{aligned}$$

$$34) \begin{aligned} g(n) &= n + 4 \\ h(n) &= n^2 - 4n \\ \text{Find } (g \circ h)(-5) \end{aligned}$$

Simplify each and state the excluded values.

$$35) \frac{x^2 + 11x + 10}{x^2 - 9x - 10}$$

$$36) \frac{5x^2 - 43x + 24}{3x^2 - 15x - 72}$$

Simplify each expression.

$$37) \frac{7x^2}{x^2 + 2x - 63} \cdot \frac{40x - 48}{35x^3 - 42x^2}$$

$$38) \frac{b^2 - 1}{5b^2} \div \frac{b^2 + 2b + 1}{b + 1}$$

$$39) \frac{2}{b-1} + \frac{2}{b-3}$$

$$40) \frac{3}{n-6} - \frac{3n}{n-1}$$

Solve each equation. Remember to check for extraneous solutions.

$$41) \frac{1}{b^2 + 4b - 5} + \frac{1}{b - 1} = \frac{3}{b^2 + 4b - 5}$$

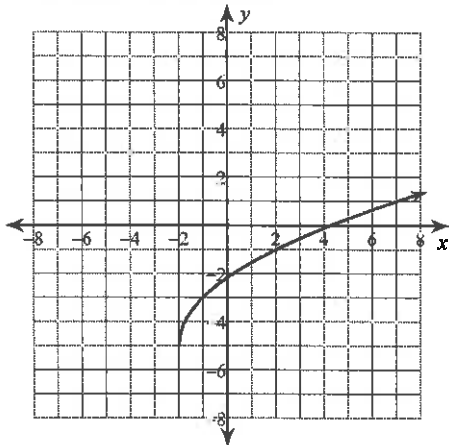
$$42) \frac{1}{n} + \frac{1}{n + 4} = \frac{n^2 - 3n - 10}{n^2 + 4n}$$

Identify the domain and range of each.

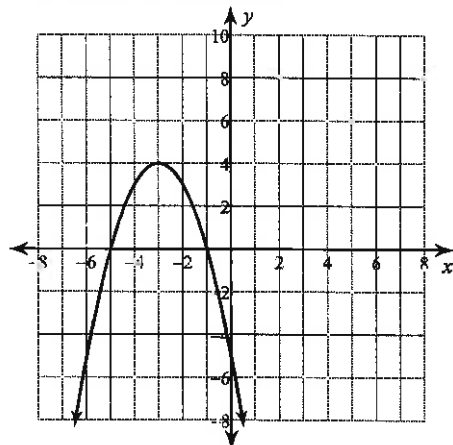
$$43) y = 1 + \sqrt{4x + 4}$$

$$44) y = \sqrt{x + 1} + 3$$

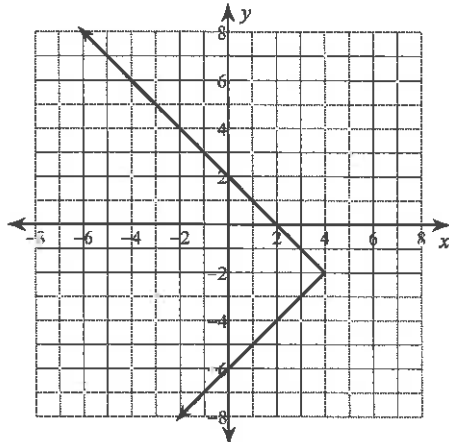
45) Find the domain and range of the graph.
Use interval notation.



46) Find the domain and range of the graph.
Use interval notation.



47) Find the domain and range of the graph.
Use interval notation.



48) Find the domain and range of the graph.
Use interval notation.

