

Pre-Calculus Summer Review**Evaluate each using the values given.**

1) $8k - (k + j^2)$; use $j = 7$, and $k = -3$

2) $-2(y - 8) + \frac{z}{2}$; use $y = 2$, and $z = 2$

Solve each equation by taking square roots.

3) $4r^2 - 3 = 78$

4) $-2 - 10x^2 = -492$

Solve each equation by factoring.

5) $p^2 + 6p + 8 = 0$

6) $n^2 - 6n = 0$

7) $2x^2 - 19x + 24 = 0$

8) $4x^2 + 20 = -21x$

9) $2r^2 - 21 = -11r$

Solve each equation with the quadratic formula.

10) $5x^2 = -7x + 4$

11) $4a^2 + 10a = 66$

Solve each equation by completing the square.

12) $a^2 - 14a + 45 = 0$

13) $x^2 - 4x - 59 = 0$

Factor each completely. (special cases)

14) $16k^2 - 9$

15) $16a^2 - 40a + 25$

16) $4a^3 + 256$

17) $27x^3 + 1$

Solve each radical equation. Remember to check for extraneous solutions.

18) $-1 = \sqrt{x-1} - 7$

19) $\sqrt{b-7} = 5$

Solve each absolute value equation.

$$20) \quad |-7x| = 56$$

$$21) \quad |5p| = 40$$

Perform the indicated operation.

$$22) \quad -5\sqrt{3}(5 + \sqrt{3})$$

$$23) \quad \sqrt{2}(2 + 2\sqrt{2})$$

$$24) \quad (-3\sqrt{3} + 2)(\sqrt{3} - 2)$$

$$25) \quad (-3\sqrt{3} - 2)(\sqrt{3} - 4)$$

$$26) \quad -2 - (3 - 8i) + (4i)$$

$$27) \quad (4 - 3i) - (1 - 7i)$$

$$28) \quad (-4 - i)(1 + 3i)$$

$$29) \quad (5 + 5i)(-1 - 4i)$$

Simplify each expression.

$$30) \frac{5n}{2} - \frac{5n}{6n+12}$$

$$31) \frac{5}{a+4} - \frac{2a}{a+1}$$

Simplify each rational expression.

$$32) \frac{\frac{m}{9} - \frac{25}{9}}{15}$$

$$33) \frac{\frac{1}{x} - \frac{3}{x-3}}{\frac{9}{x-3}}$$

State the possible number of imaginary zeros and the possible number of positive and negative zeros for each function. Then find all zeros.

$$34) f(x) = x^3 - 2x^2 + x - 12$$

$$35) f(x) = 4x^3 + 8x^2 + 5x + 1$$

Evaluate each expression.

$$36) \log_2 16$$

$$37) \log_2 64$$

Expand each logarithm.

38) $\log_2 (a \cdot b \cdot c^4)$

39) $\log_5 \frac{x^4}{y^4}$

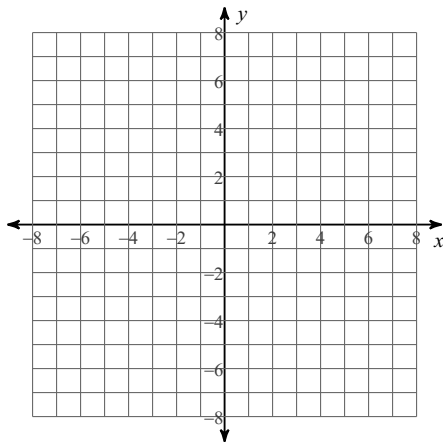
Condense each expression to a single logarithm.

40) $2\log_9 a - 4\log_9 b$

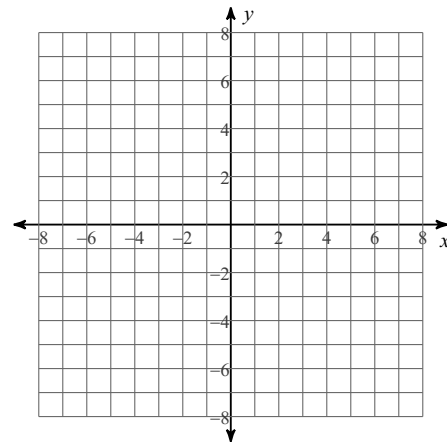
41) $4\log_8 u + 16\log_8 v$

Sketch the graph of each function.

42) $y = \sqrt{x} + 2$

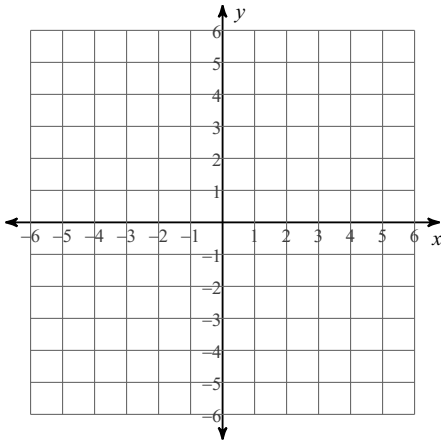


43) $y = \sqrt{x} - 4$

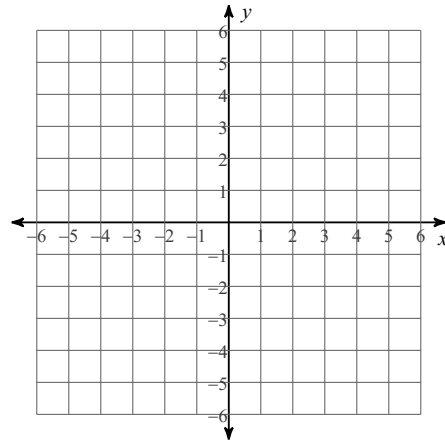


Graph each equation.

44) $y = |x - 3|$

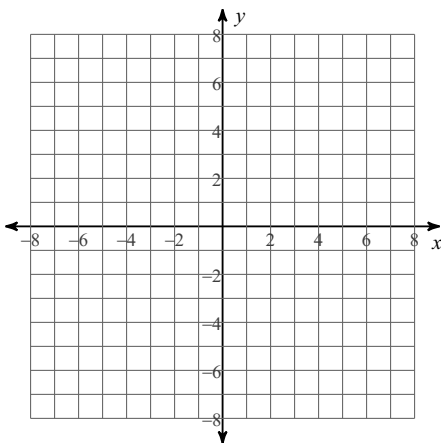


45) $y = |x| - 2$

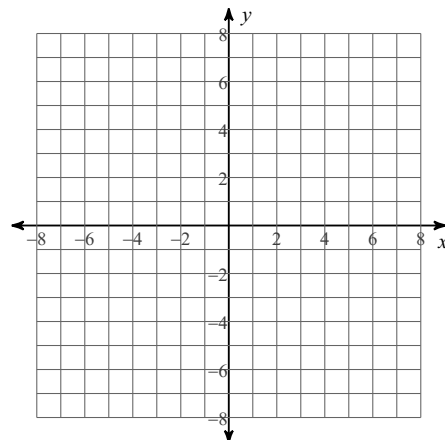


Graphing quadratics (parabolas). Identify the vertex and axis of symmetry of each. Then sketch the graph.

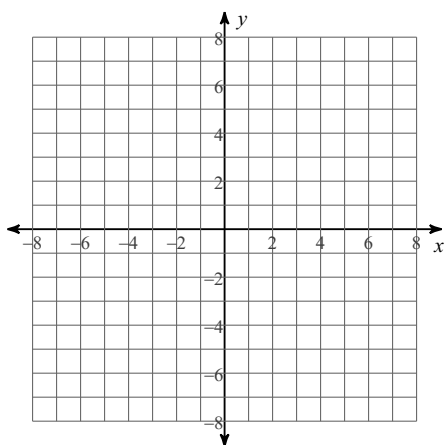
46) $y = x^2 - 12x + 37$



47) $y = -2(x + 1)^2 - 3$

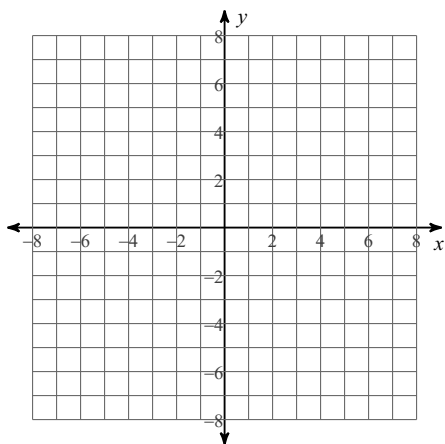


48) $y = -2x^2 - 5$

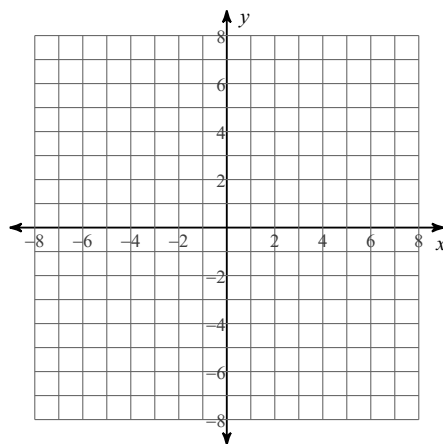


Sketch the graph of each function.

49) $f(x) = x^3 - 4x^2 + 7$



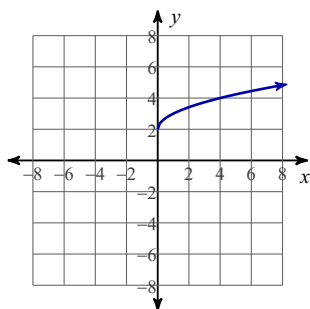
50) $f(x) = -x^3 + x^2 + 1$



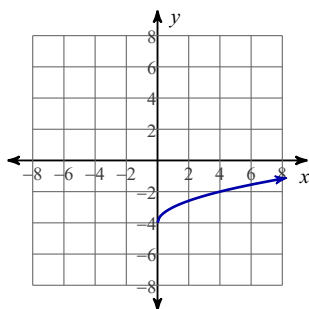
Answers to Pre-Calculus Summer Review

- 1) -70 2) 13 3) $\left\{\frac{9}{2}, -\frac{9}{2}\right\}$ 4) $\{7, -7\}$
- 5) $\{-4, -2\}$ 6) $\{6, 0\}$ 7) $\left\{\frac{3}{2}, 8\right\}$ 8) $\left\{-\frac{5}{4}, -4\right\}$
- 9) $\left\{\frac{3}{2}, -7\right\}$ 10) $\left\{\frac{-7 + \sqrt{129}}{10}, \frac{-7 - \sqrt{129}}{10}\right\}$ 11) $\left\{3, -\frac{11}{2}\right\}$
- 12) $\{9, 5\}$ 13) $\{2 + 3\sqrt{7}, 2 - 3\sqrt{7}\}$ 14) $(4k + 3)(4k - 3)$
- 15) $(4a - 5)^2$ 16) $4(a + 4)(a^2 - 4a + 16)$ 17) $(3x + 1)(9x^2 - 3x + 1)$
- 18) $\{37\}$ 19) $\{32\}$ 20) $\{-8, 8\}$ 21) $\{8, -8\}$
- 22) $-25\sqrt{3} - 15$ 23) $2\sqrt{2} + 4$ 24) $-13 + 8\sqrt{3}$ 25) $-1 + 10\sqrt{3}$
- 26) $-5 + 12i$ 27) $3 + 4i$ 28) $-1 - 13i$ 29) $15 - 25i$
- 30) $\frac{15n^2 + 25n}{6(n + 2)}$ 31) $\frac{-2a^2 - 3a + 5}{(a + 4)(a + 1)}$ 32) $\frac{m - 25}{135}$ 33) $\frac{-2x - 3}{9x}$
- 34) Possible # of imaginary zeros: 2 or 0
Possible # positive real zeros: 3 or 1
Possible # negative real zeros: 0
Zeros: $\left\{3, \frac{-1 + i\sqrt{15}}{2}, \frac{-1 - i\sqrt{15}}{2}\right\}$
- 35) Possible # of imaginary zeros: 2 or 0
Possible # positive real zeros: 0
Possible # negative real zeros: 3 or 1
Zeros: $\left\{-\frac{1}{2} \text{ mult. } 2, -1\right\}$
- 36) 4 37) 6 38) $\log_2 a + \log_2 b + 4\log_2 c$
- 39) $4\log_5 x - 4\log_5 y$ 40) $\log_9 \frac{a^2}{b^4}$ 41) $\log_8 (v^{16} u^4)$

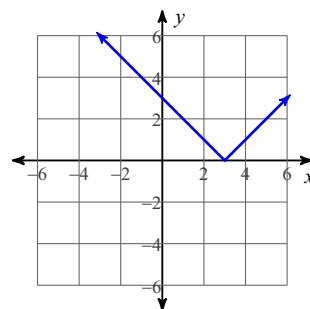
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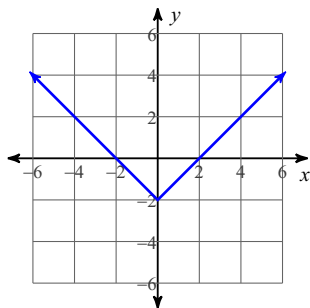
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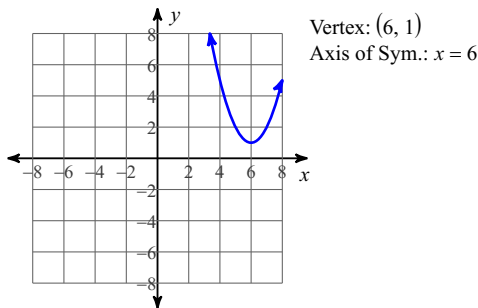
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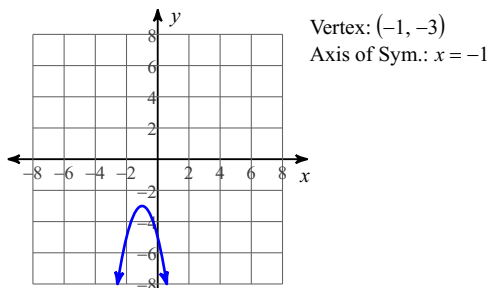
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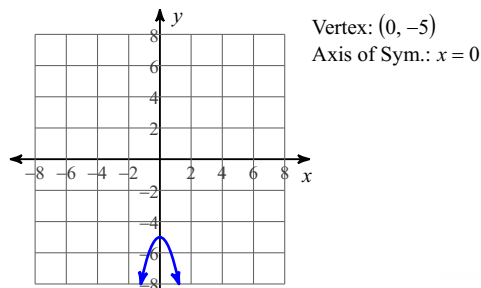
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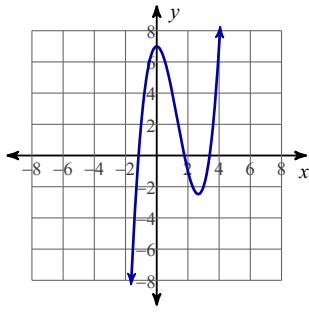
47)



48)



49)



50)

