

AP 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) $36r^2 - 8 = 1$

4) $4k^2 - 4 = 140$

Solve each equation by factoring.

5) $x^2 + 2x - 15 = 0$

6) $v^2 + 7v = 0$

7) $2b^2 + 3b - 2 = 0$

8) $2x^2 = -3x + 35$

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

Solve each equation with the quadratic formula.

10) $7k^2 = -9k + 3$

11) $6k^2 - 136 = -10k$

Solve each equation by completing the square.

12) $m^2 + 16m - 31 = 0$

13) $4x^2 - 16x - 9 = 0$

Factor each completely. (special cases)

14) $9x^2 - 16$

15) $25v^2 + 20v + 4$

16) $256 + 108m^3$

17) $125a^3 + 27$

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. (basic calculator only)

$$36) \log_2 16$$

$$37) \log_2 64$$

Expand each logarithm.

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

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

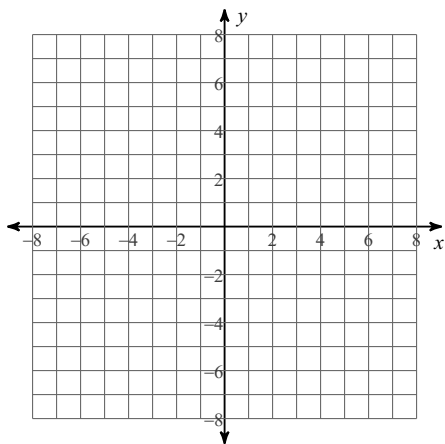
Condense each expression to a single logarithm.

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

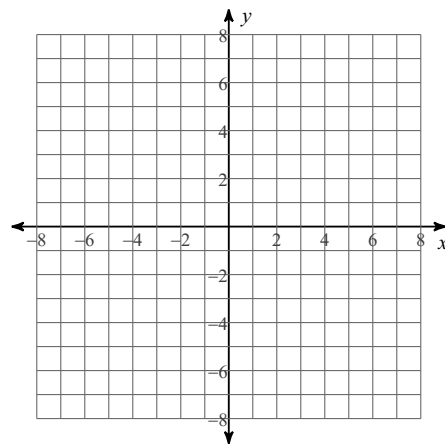
41) $4\log_8 u + 16\log_8 v$

Sketch the graph of each function. (Basic calculator only)

42) $y = 2\sqrt{x} + 1$

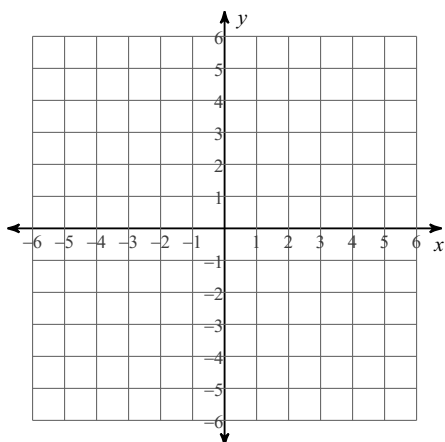


43) $y = \sqrt{x} + 3$

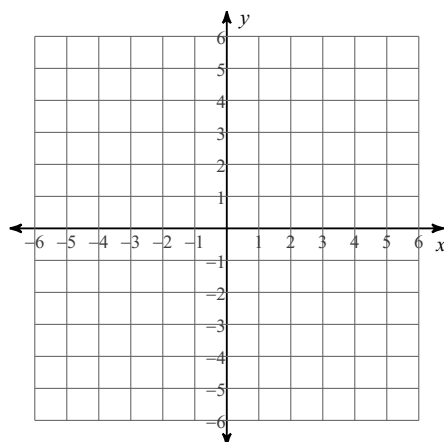


Graph each equation. (Basic Calculator only)

44) $y = |x + 4|$

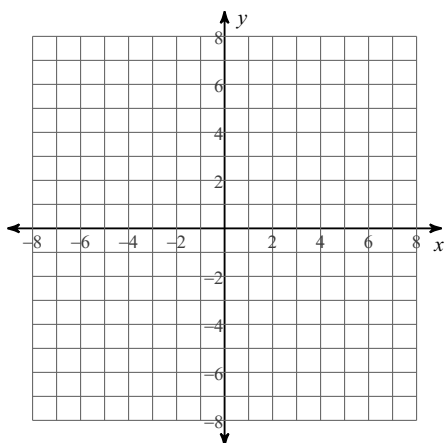


45) $y = |x| + 3$

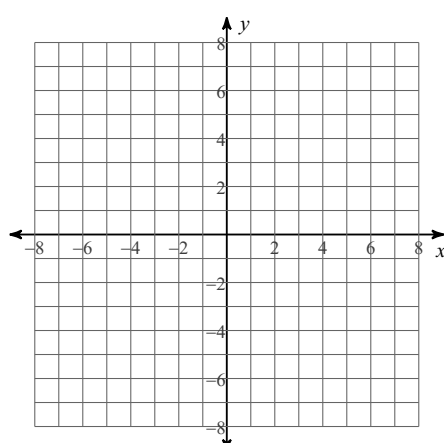


Graphing quadratics (parabolas). Identify the vertex and axis of symmetry of each. Then sketch the graph. (Basic calculator only)

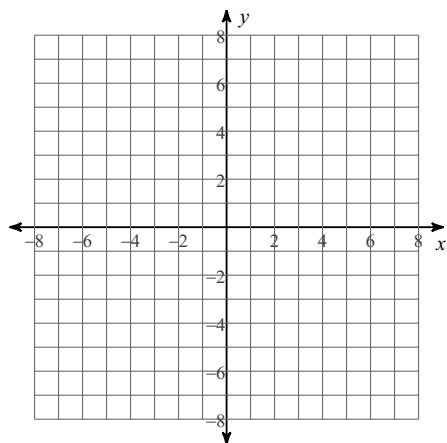
46) $y = x^2 - 6x + 4$



47) $y = (x - 5)^2 + 3$

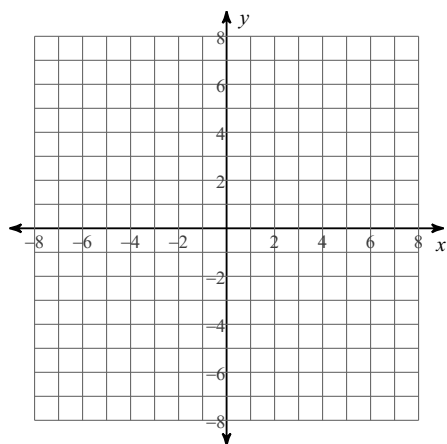


48) $y = -2x^2 - 5$

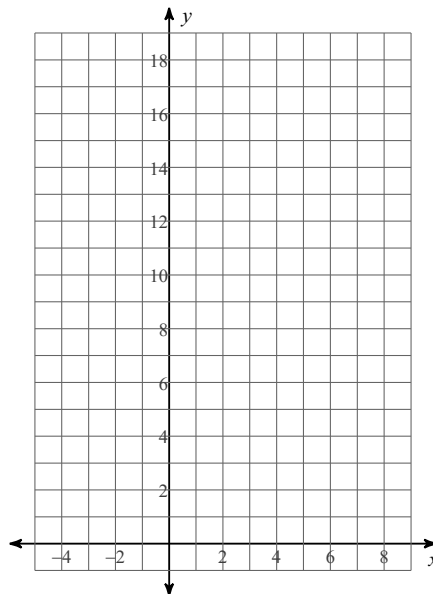


Sketch the graph of each function. (Basic calculator only)

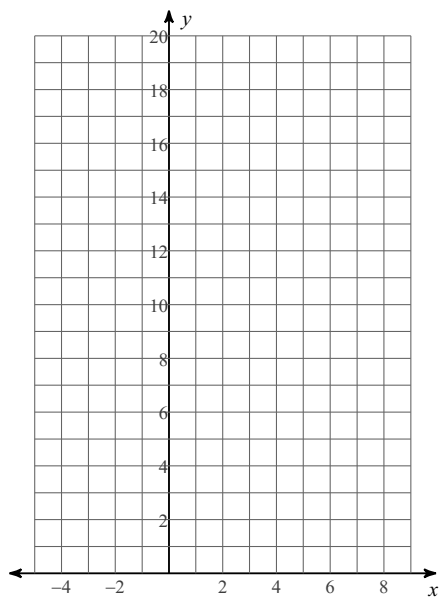
49) $y = \log_3(x - 3) + 1$



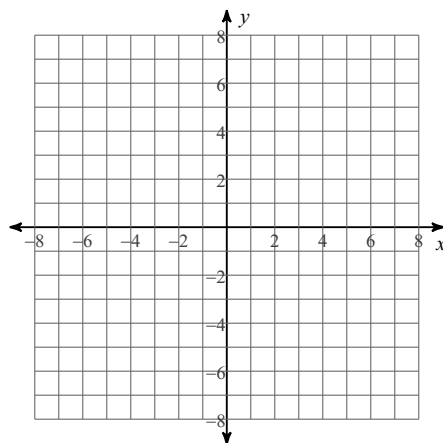
50) $y = 2^{x-2} - 1$



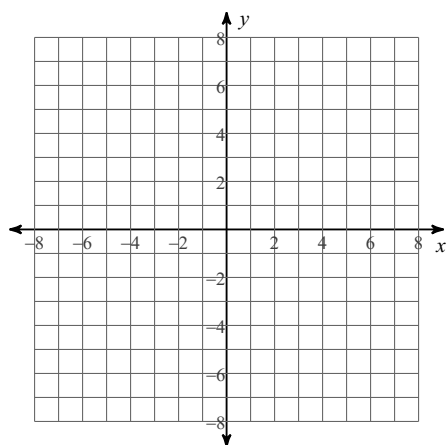
51) $y = 4^{x-2} + 1$



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

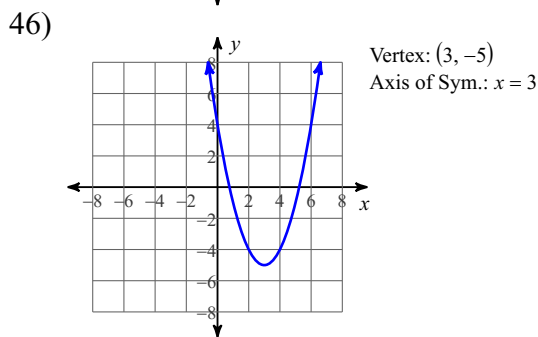
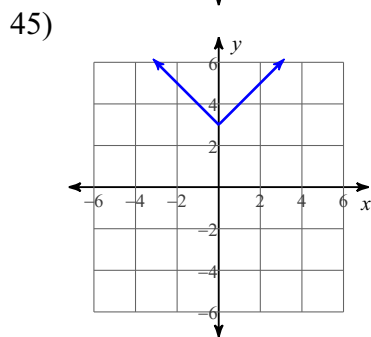
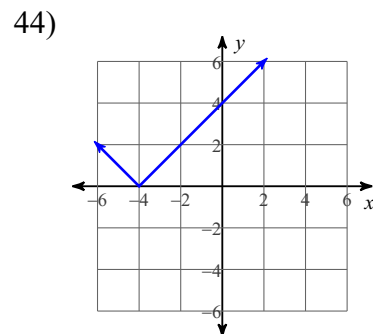
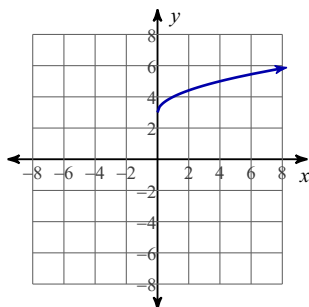
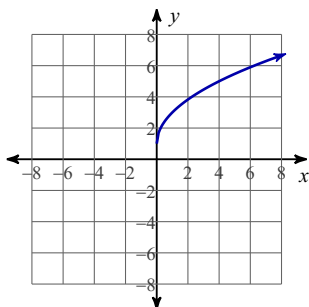


53) $f(x) = -x^3 + x^2 + 1$

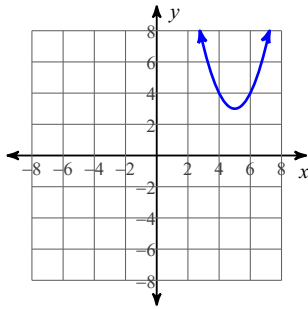


Answers to Honors Pre-Calculus Summer Review

- 1) -70 2) 13 3) $\left\{\frac{1}{2}, -\frac{1}{2}\right\}$ 4) $\{6, -6\}$
- 5) $\{3, -5\}$ 6) $\{-7, 0\}$ 7) $\left\{\frac{1}{2}, -2\right\}$ 8) $\left\{\frac{7}{2}, -5\right\}$
- 9) $\left\{\frac{3}{2}, -7\right\}$ 10) $\left\{\frac{-9 + \sqrt{165}}{14}, \frac{-9 - \sqrt{165}}{14}\right\}$ 11) $\left\{4, -\frac{17}{3}\right\}$
- 12) $\{-8 + \sqrt{95}, -8 - \sqrt{95}\}$ 13) $\left\{\frac{9}{2}, -\frac{1}{2}\right\}$ 14) $(3x + 4)(3x - 4)$
- 15) $(5v + 2)^2$ 16) $4(4 + 3m)(16 - 12m + 9m^2)$ 17) $(5a + 3)(25a^2 - 15a + 9)$
- 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) $\log_8 (v^{16}u^4)$
- 42) 43) 44)

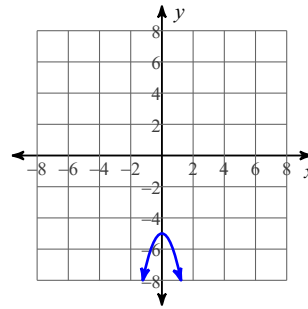


47)



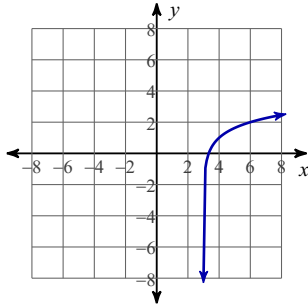
Vertex: $(5, 3)$
 Axis of Sym.: $x = 5$

48)

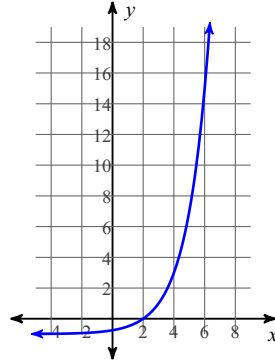


Vertex: $(0, -5)$
 Axis of Sym.: $x = 0$

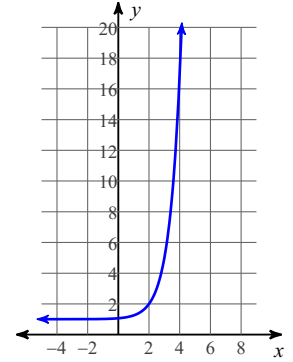
49)



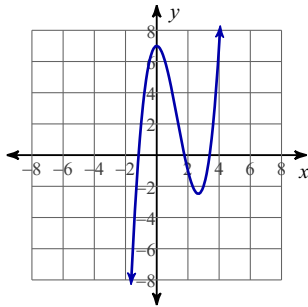
50)



51)



52)



53)

