Review for students taking PreCalc Functions

Identify the domain and range of each. Write in interval notation.

1) $y = -5 + \frac{4}{5} \cdot \sqrt{x+2}$

2) $y = 3\sqrt{x-3} + 2$

3) $y = -2 + 3\sqrt{x-2}$

4) $y = -4 + 3\sqrt{x-4}$

5) $y = 3\sqrt{x-3} - 1$

6) $y = 1 + \frac{3}{4} \cdot \sqrt{x+5}$

Simplify each expression.

7) $6(-x-2) - 6x(4x+4)$

8) $-(k-7) + k(1+8k)$

9) $-8(x+6) + 5x(3+4x)$

10) $-7n(1-8n) + 8n(4+3n)$

Solve each equation by completing the square.

11) $x^2 - 18x - 50 = -10$

12) $7n^2 + 14n - 104 = -10$

13) $7p^2 - 14p - 77 = 4$

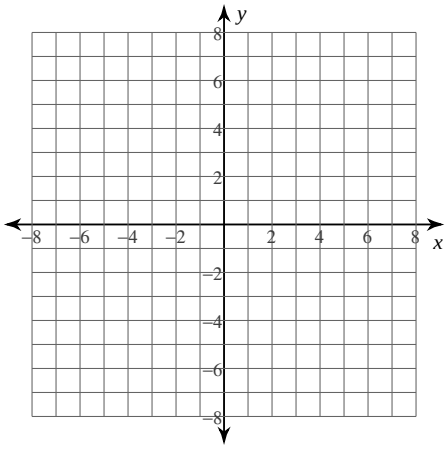
14) $6r^2 - r - 42 = 10$

15) $m^2 - 13m + 35 = -7$

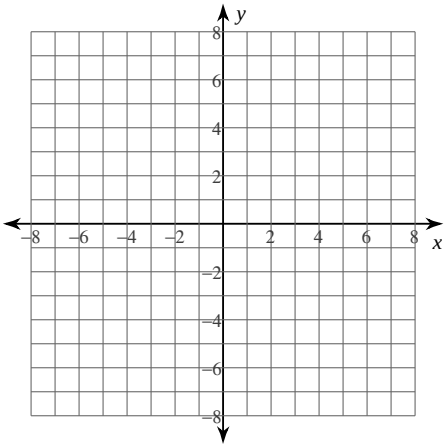
16) $6x^2 - 14x - 22 = -2$

Identify the vertex and axis of symmetry of each. Then sketch the graph.

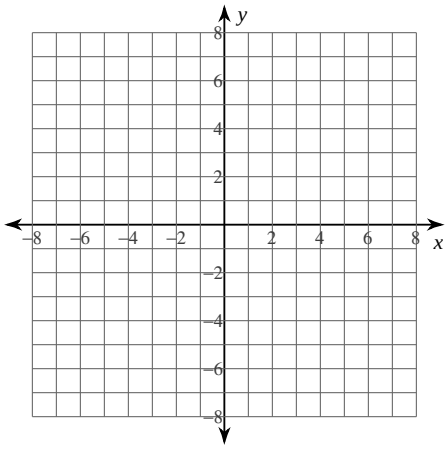
17) $f(x) = -\frac{1}{3}(x - 4)(x - 1)$



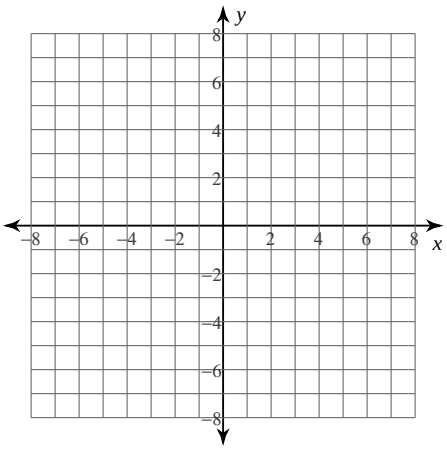
18) $f(x) = -(x - 3)(x + 1)$



19) $f(x) = 2(x+4)(x+3)$



20) $f(x) = -x^2 - 4x - 5$



Factor each completely.

21) $m^4 + 2m^2 - 15$

22) $x^4 + 2x^2 - 8$

23) $x^4 + x^2$

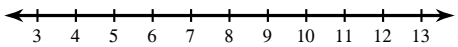
24) $21u^7 + 192u^5 + 192u^3$

25) $7x^4 + 36x^2 + 5$

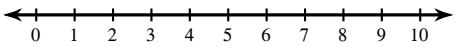
26) $3u^4 + 10u^2 + 8$

Solve each inequality and graph its solution.

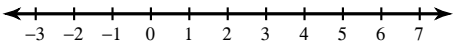
27) $-4n - 8(-8n + 6) > 312$



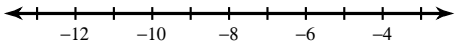
28) $112 \le -4(-3x - 4)$



29) $-8(p + 8) > -96$



30) $-190 \ge 5(5n - 8)$



Find each product.

31) $(4n^2 - n - 1)(6n - 8)$

32) $(8v^2 + 7v + 8)(3v - 6)$

33) $(6a^2 + 4a - 2)(3a - 8)$

34) $(5x - 5)(x - 1)$

35) $(3x + 7)(3x + 3)$

36) $(8n^2 - 8n + 5)(4n^2 - 7n - 1)$

37) $(2k^2 - 3k - 4)(5k^2 - 7k - 8)$

Answers to Review for students taking PreCalc Functions

1) Domain: $x \geq -2$
Range: $y \geq -5$

2) Domain: $x \geq 3$
Range: $y \geq 2$

3) Domain: $x \geq 2$
Range: $y \geq -2$

4) Domain: $x \geq 4$
Range: $y \geq -4$

5) Domain: $x \geq 3$
Range: $y \geq -1$

6) Domain: $x \geq -5$
Range: $y \geq 1$

7) $-30x - 12 - 24x^2$

8) $7 + 8k^2$

9) $7x - 48 + 20x^2$

10) $25n + 80n^2$

11) $\{20, -2\}$

12) $\left\{\frac{-7+\sqrt{707}}{7}, \frac{-7-\sqrt{707}}{7}\right\}$

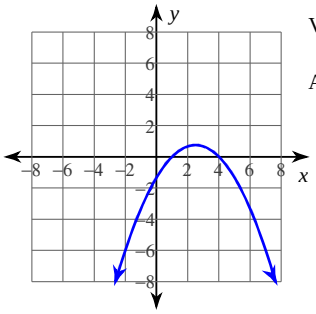
13) $\left\{\frac{7+2\sqrt{154}}{7}, \frac{7-2\sqrt{154}}{7}\right\}$

14) $\left\{\frac{1+\sqrt{1249}}{12}, \frac{1-\sqrt{1249}}{12}\right\}$

15) $\{7, 6\}$

16) $\left\{\frac{10}{3}, -1\right\}$

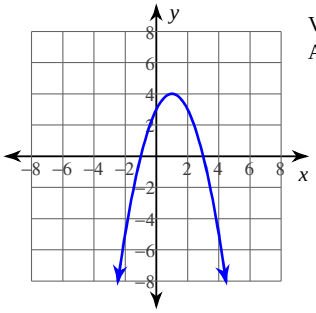
17)



Vertex: $\left(\frac{5}{2}, \frac{3}{4}\right)$

Axis of Sym.: $x = \frac{5}{2}$

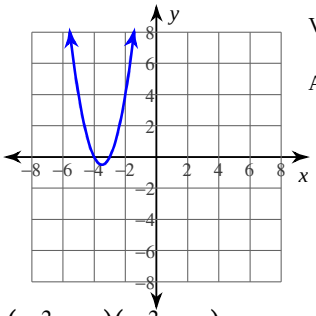
18)



Vertex: $(1, 4)$

Axis of Sym.: $x = 1$

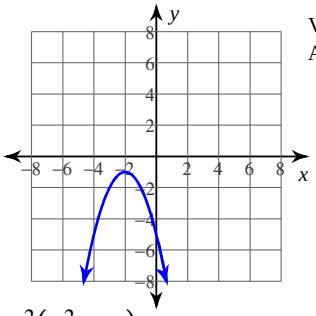
19)



Vertex: $\left(-\frac{7}{2}, -\frac{1}{2}\right)$

Axis of Sym.: $x = -\frac{7}{2}$

20)



Vertex: $(-2, -1)$

Axis of Sym.: $x = -2$

21) $(m^2 - 3)(m^2 + 5)$

22) $(x^2 + 4)(x^2 - 2)$

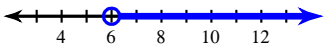
23) $x^2(x^2 + 1)$

24) $3u^3(7u^2 + 8)(u^2 + 8)$

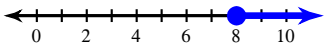
25) $(7x^2 + 1)(x^2 + 5)$

26) $(3u^2 + 4)(u^2 + 2)$

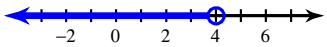
27) $n > 6$:



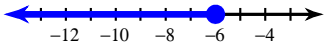
28) $x \geq 8$:



29) $p < 4$:



30) $n \leq -6$:



31) $24n^3 - 38n^2 + 2n + 8$

32) $24v^3 - 27v^2 - 18v - 48$

33) $18a^3 - 36a^2 - 38a + 16$

34) $5x^2 - 10x + 5$

35) $9x^2 + 30x + 21$

36) $32n^4 - 88n^3 + 68n^2 - 27n - 5$

37) $10k^4 - 29k^3 - 15k^2 + 52k + 32$