

(For students who have completed Algebra 2)

Date \_\_\_\_\_ Period \_\_\_\_\_

**Solve each equation by completing the square.**

1)  $b^2 + 8b = -7$

2)  $4v^2 - 8v - 54 = -9$

**Simplify each expression.**

3) 
$$\frac{\frac{m}{9}}{\frac{m}{4} - \frac{9}{m^2}}$$

4) 
$$\frac{\frac{25}{2}}{\frac{x}{2} - \frac{4}{5x}}$$

5)  $5(1 + 7a) + 6$

6)  $10k + 5(k - 10)$

**Divide.**

7)  $(x^3 + 2x^2 + 7x + 24) \div (x + 3)$

8)  $(7x^3 - 42x^2 - 45x - 38) \div (x - 7)$

**Simplify.**

9)  $\frac{5}{2 - 2\sqrt{5}}$

10)  $\frac{3\sqrt{3} - 5}{\sqrt{2} - 3}$

**Simplify each and state the excluded values.**

11)  $\frac{2}{p-5} \cdot \frac{p+2}{p^2-5p-14}$

12)  $\frac{x-4}{2x-16} \cdot \frac{x^2+2x-80}{x-4}$

**Identify the domain and range of each.**

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

14)  $y = 2\sqrt{x+4} - 4$

**Solve each equation.**

15)  $12 - 6x = -4(-6x - 3)$

16)  $-8(7n - 2) = -32 - 8n$

**Find all roots.**

17)  $x^3 - 8x^2 - 25x = 0$

18)  $x^3 - 3x^2 - x + 3 = 0$

**Solve each equation by taking square roots.**

19)  $4x^2 + 4 = -22$

20)  $3a^2 + 7 = 295$

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

21)  $\sqrt{1 - 3p} = \sqrt{4 - 2p}$

22)  $\frac{2p-3}{2p} + \frac{1}{2p} = \frac{6}{p}$

23)  $\frac{3x+15}{4x^2} - \frac{1}{2x^2} = \frac{1}{x^2}$

**Simplify. Your answer should contain only positive exponents.**

24)  $-\frac{yx^4 \cdot y}{(-y^5)^0}$

25)  $(2x^4y^3 \cdot 2xy^{-4})^3$

**Factor each completely.**

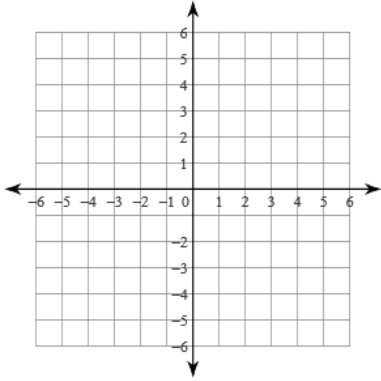
26)  $15n^3 - 40n^2 + 24n - 64$

27)  $n^2 + 2n - 8$

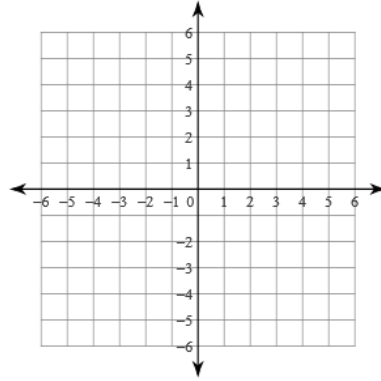
28)  $9v^2 - 6v + 1$

Sketch the graph of each line.

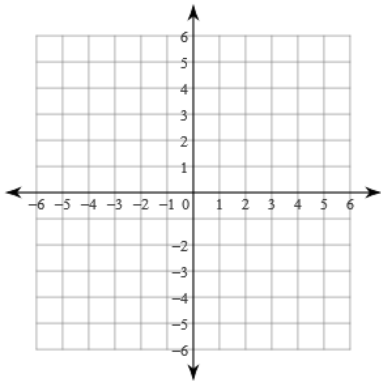
29)  $x + y = -1$



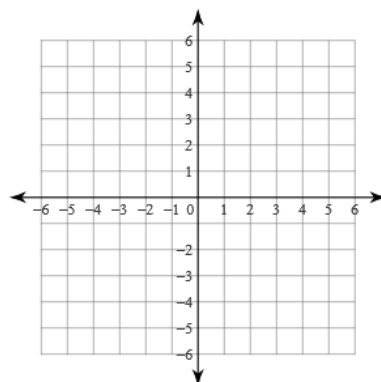
30)  $4x - y = -1$



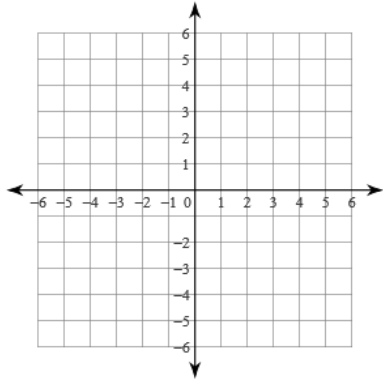
31)  $y = x + 3$



32)  $y = -\frac{7}{2}x + 5$



33)  $-\frac{5}{2} = x + \frac{1}{2}y$



**Write the slope-intercept form of the equation of each line given the slope and y-intercept.**

34) Slope =  $-\frac{1}{3}$ , y-intercept = 0

**Write the slope-intercept form of the equation of each line.**

35)  $-\frac{21}{19}y = -3 + \frac{3}{19}x$

**Write the slope-intercept form of the equation of the line through the given point with the given slope.**

36) through:  $(-3, 1)$ , slope =  $\frac{1}{4}$

**Write the slope-intercept form of the equation of the line through the given points.**

37) through:  $(-4, 3)$  and  $(-3, -3)$

**Write the slope-intercept form of the equation of the line described.**

38) through:  $(-2, 5)$ , perp. to  $y = 5x + 5$

Evaluate each using the values given.

39)  $\left(\frac{y}{6}\right)^2 + y + x$ ; use  $x = -3$ , and  $y = -6$

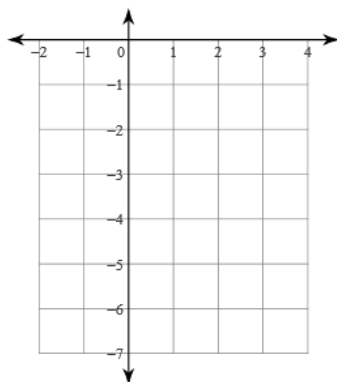
40)  $(p + q)^2 - (r - p)$ ; use  $p = -6$ ,  $q = 1$ , and  $r = 8$

41) An aircraft carrier left the Dania Pier nine hours before a submarine. The ships traveled in opposite directions. The submarine traveled at 21 km/h for four hours. After this time the ships were 318 km apart. What was the aircraft carrier's speed?

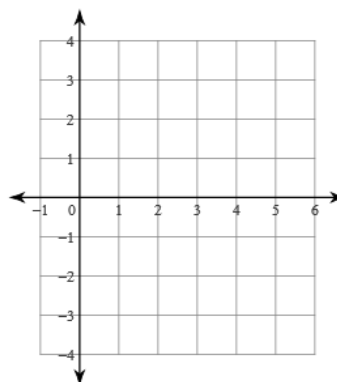
42) A cattle train made a trip to the repair yards and back. The trip there took three hours and the trip back took five hours. What was the cattle train's average speed on the trip there if it averaged 24 km/h on the return trip?

Sketch the graph of each function.

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



44)  $f(x) = \frac{1}{2}(x - 4)^2 - 1$



Answers to (For students who have completed Algebra 2) (ID: 1)

1)  $\{-1, -7\}$

2)  $\left\{\frac{9}{2}, -\frac{5}{2}\right\}$

3)  $\frac{4m^3}{9m^3 - 324}$

4)  $\frac{125x}{5x^2 - 8}$

5)  $11 + 35a$

6)  $15k - 50$

7)  $x^2 - x + 10 - \frac{6}{x+3}$

8)  $7x^2 + 7x + 4 - \frac{10}{x-7}$

9)  $\frac{-5 - 5\sqrt{5}}{8}$

10)  $\frac{-3\sqrt{6} - 9\sqrt{3} + 5\sqrt{2} + 15}{7}$

11)  $\frac{2}{(p-5)(p-7)}$ ;  $\{5, -2, 7\}$

12)  $\frac{x+10}{2}$ ;  $\{8, 4\}$

13) Domain:  $x \geq 0$   
Range:  $y \leq 1$

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

15)  $\{0\}$

16)  $\{1\}$

17)  $\{0, 4 + \sqrt{41}, 4 - \sqrt{41}\}$

18)  $\{3, -1, 1\}$

19)  $\left\{\frac{i\sqrt{26}}{2}, -\frac{i\sqrt{26}}{2}\right\}$

20)  $\{4\sqrt{6}, -4\sqrt{6}\}$

21)  $\{-3\}$

22)  $\{7\}$

23)  $\{-3\}$

24)  $-y^2x^4$

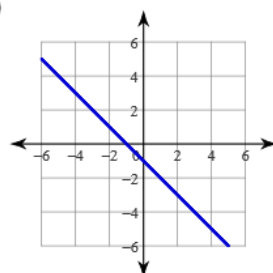
25)  $\frac{64x^{15}}{y^3}$

26)  $(5n^2 + 8)(3n - 8)$

27)  $(n-2)(n+4)$

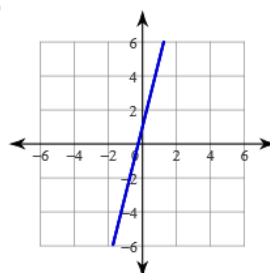
28)  $(3v - 1)^2$

29)



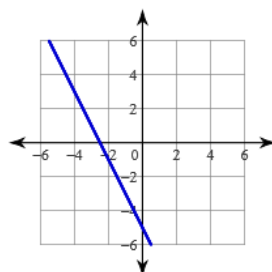
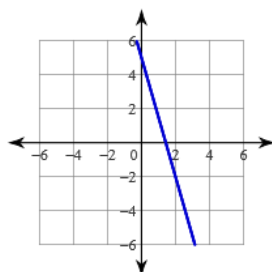
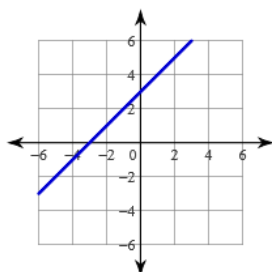
32)

30)



33)

31)



34)  $y = -\frac{1}{3}x$

35)  $y = -\frac{1}{7}x + \frac{19}{7}$

36)  $y = \frac{1}{4}x + \frac{7}{4}$

37)  $y = -6x - 21$

38)  $y = -\frac{1}{5}x + \frac{23}{5}$

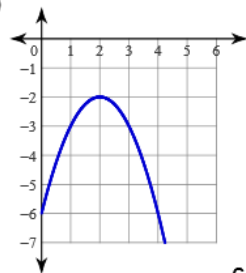
39)  $-8$

40)  $11$

41)  $18 \text{ km/h}$

42)  $40 \text{ km/h}$

43)



44)

