Math 10 Foundations Final Review

*Does not include level 4 questions. Does not include outcomes 3a and 3b

Outcomes 1A

Level 2

1. Write the prime factorization of 168

2. Find the GCF and the LCM of 40 and 64

3. Find the GCF and LCM of 6 and 10

Level 3

4. Find the square root (without using the $\sqrt{\ }$ button on your calculator). Show your work.

   a) 576 b) 8100

5. Find the cube root (without using the $\sqrt[3]{\ }$ button on your calculator). Show your work.

   a) 4096 b) 512

Outcome 2a
Level 2/3

6. Write each mixed radical as an entire radical

a) $12\sqrt{3}$ b) $3\sqrt[3]{7}$ c) $2\sqrt[5]{15}$

7. Write each as a mixed radical in simplest form.

a) $\sqrt{45}$ b) $\sqrt[3]{128}$ c) $\sqrt{539}$

d) $\sqrt{80}$ e) $\sqrt{75}$ d) $\sqrt[3]{108}$

8. Place each number on a number line, and then order the numbers from least to greatest.

$$\sqrt[3]{30}, \sqrt{20}, \sqrt[4]{18}, \sqrt[3]{-30}, \sqrt{30}, \sqrt[4]{10}$$

9. Determine if the following are rational or irrational. Explain how you know.

a) $\sqrt{26}$ b) $\sqrt[3]{81}$

Outcome 2b

Level 2

10. Rewrite the following with positive exponents only

a) x^{-3} b) $\frac{1}{d^{-4}}$ c) $\left(\frac{a}{b}\right)^{-2}$

11. Rewrite the following as a radical. Do not evaluate

a) $(-8)^{\frac{5}{3}}$ b) $48^{\frac{1}{2}}$ c) $25^{\frac{3}{4}}$ d) $7^{-\frac{1}{3}}$

12. Rewrite the following as an exponent. Do not evaluate

a) $\sqrt[3]{4}$ b) $\left(\sqrt{5}\right)^3$ c) $\sqrt[4]{x^3}$

13. Write as a single power.

a) y^3y^2 b) $\frac{a^6}{a^2}$ c) $(d^7)^2$

14. Evaluate the following. NO DECIMAL ANSWERS

a) 3^{-2} b) 4^{-3}

level 3

c) $(27)^{\frac{2}{3}}$ d) $27^{-\frac{1}{3}}$

15. Simplify the following with positive exponents only.

a) $m^{-7} \times m^{3}$ b) $\frac{a^{3}}{a^{-8}}$ c) $(x^2y^{-3})^4$ d) $(a^3b)(a^{-1}b^4)$

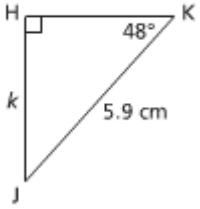
e) $\frac{x^2y}{x^3y^{-2}}$ f) $\left(\frac{x^2y}{y^{-2}}\right)^{-2}$ g) $(3m^4n)^2$ h) $(m^2n^{-4})^{-2}$

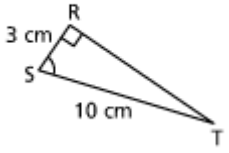
g) $\left(g^{\frac{2}{3}}h^{\frac{-3}{4}}\right)\left(g^{\frac{1}{4}}h^{\frac{1}{2}}\right)$ h) $\left(x^{\frac{-2}{5}}\right)^{\frac{2}{3}}$ i) $\left(\frac{4x^{\frac{3}{4}}}{9x^3}\right)^{-\frac{1}{2}}$

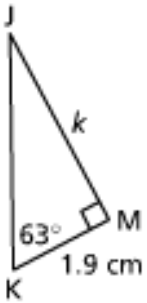
<u>Outcome 4</u>

level 2/3

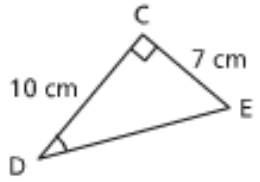
16. Determine the indicated measurement

a) 

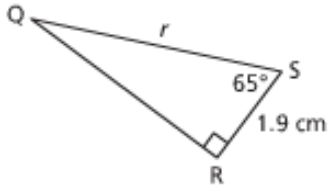
b) 

c) 

d)



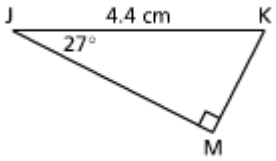
e)



Level 4

17. Solve the triangle

a)



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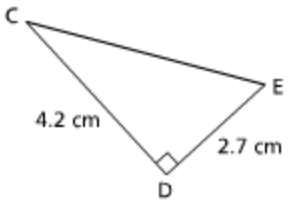


<u>Outcome 5A</u>

18. Expand and Simplify

a) $(9 + m)(9 + m)$

b) $(3a - 5)(2a - 3)$

c) $(2n + 3p)(5n - 4p)$

d) $(w + 4)(-2w^2 + 7w - 8)$

e) $(4 + 3x - 2x^2)(-2 + 2x + 3x^2)$ f) $(2m + 3n - 5)(3m - 4n)$

g) $(3x - 2)^2$

Outcome 5b

19. Factor the following

Factor by removing the gcf

a) $14a^3b^2 - 28b^3c^2 + 21a^2c^3$

Factor the following. Remember to always remove the gcf first if possible

b) $n^2 - n - 12$ c) $36r^2 - 64m^2$ d) $6m^2 + 23m - 18$

e) $w^2 - 22wx + 121x^2$ f) $8m - 4m^2$ g) $-24m^2n - 6mn^2$

h) $x^2 + 8x + 12$ i) $q^2 + 6q + 8$ j) $u^2 - 12u + 27$

k) $6m^2 + 5m - 21$

l) $16v^2 - 49$

m) $9y^2 - 25x^2$

n) $x^2 - 5x$

o) $2w^2 + 3w - 20$

p) $5w^2 + 15w + 10$

q) $6x^2 - 13xy - 5y^2$

r) $3x^2 - 14x + 8$

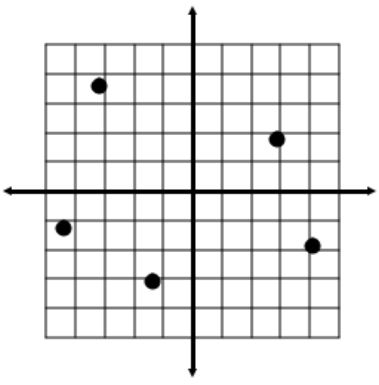
s) $16x^4 - 1$

Outcomes 6

Level 2

20. Determine if each relation below is a function.

a)



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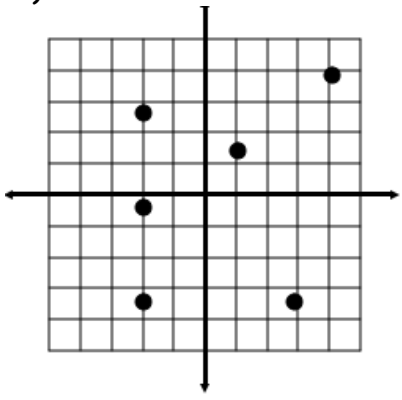


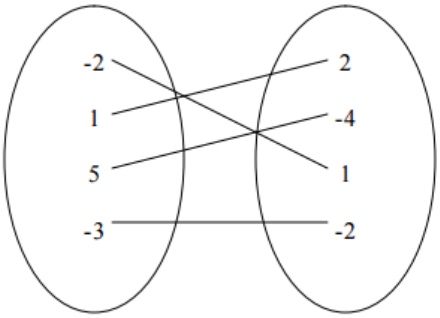
c)

x	y
8	-3
7	-3
6	-3
5	-3
4	-3

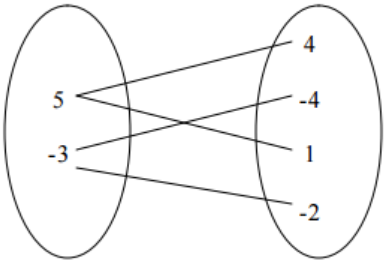
d)

x	y
-2	7
6	4
-1	-2
-2	3

e)



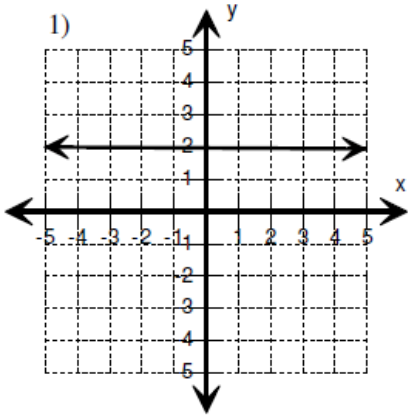
f)



g) {(1, 3), (1, 5), (2, 7), (2, 9)}

h) {(1, 5), (3, 5), (4, 6), (9, 0)}

i)



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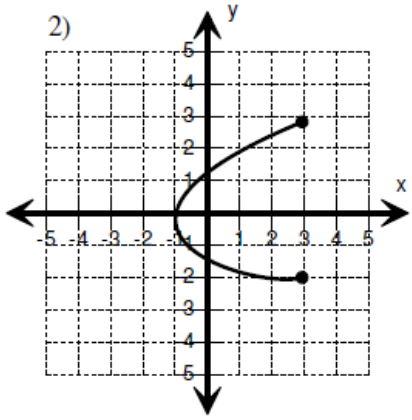
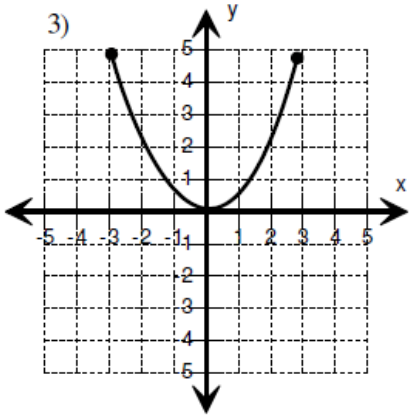


k)

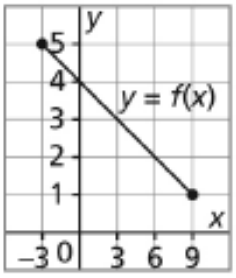


level2/3

21. State the Domain & Range of the following:

a) {(1, 3), (2, 5), (3, 7), (4, 7)}

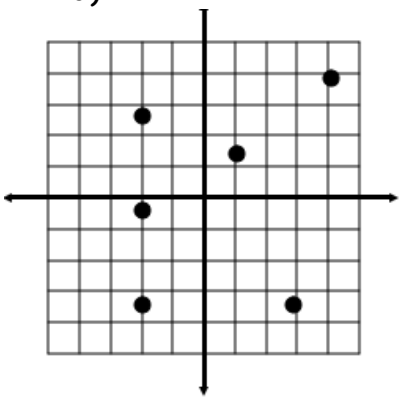
b)



b)

x	y
-2	7
6	4
-1	-2
-2	3

d)



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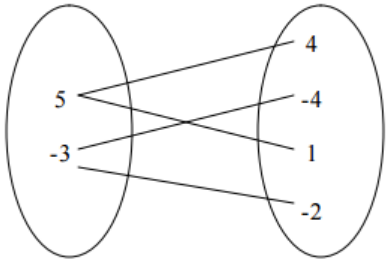

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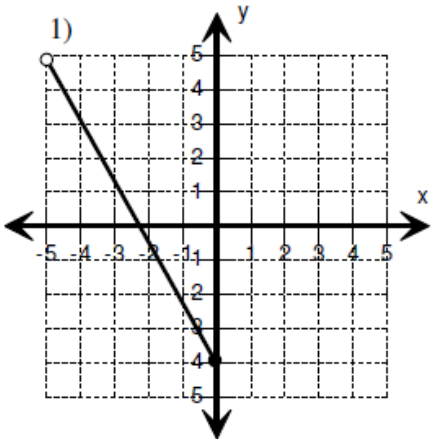
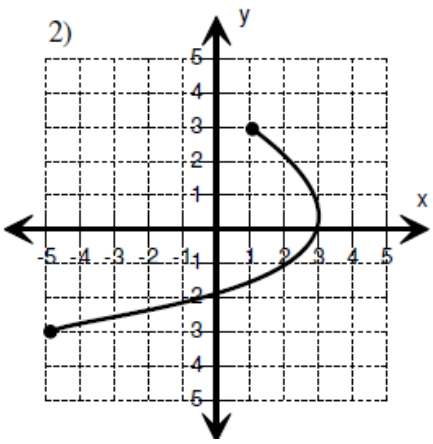
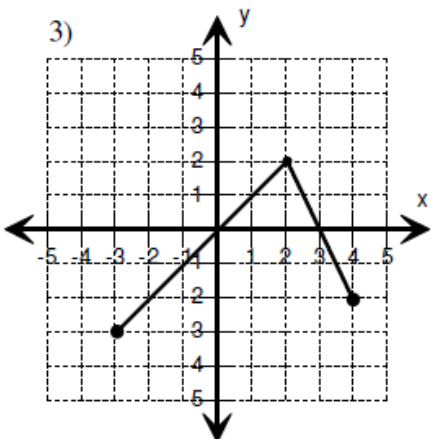


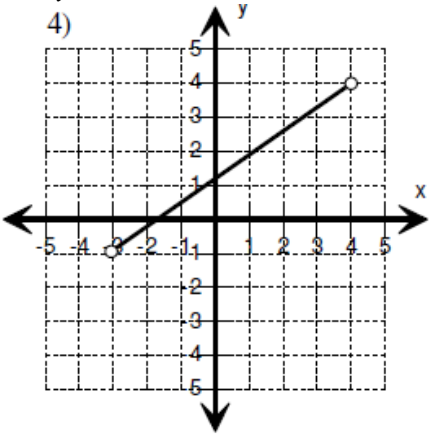
g)



h)



i)



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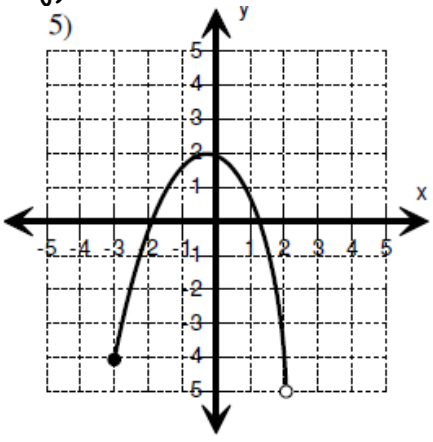
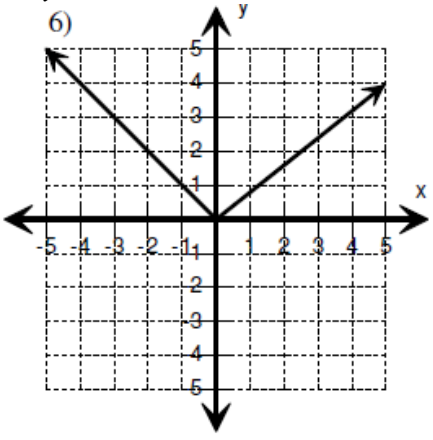


k)



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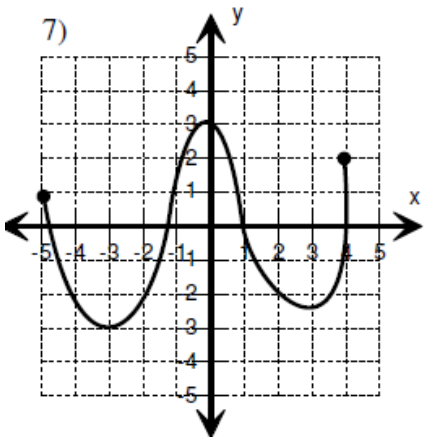
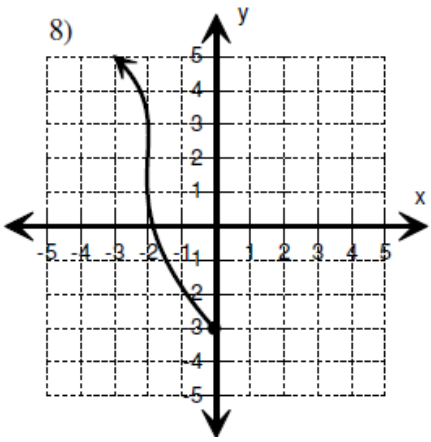
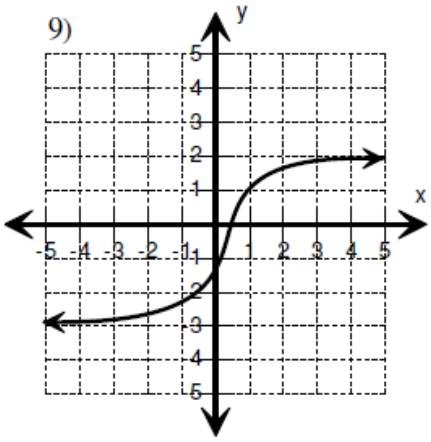


m)



n)



Outcome7

22. Determine the slope of a line for each equation

a) $y = -2x + 7$ b) $y + 7 = 3(x - 8)$ c) $y = 9 - 5x$ d) $y = x$

23. A line has slope $\frac{3}{5}$

a) What is the slope of a line that is parallel to this one?

b) What is the slope of a line that is perpendicular to this one?

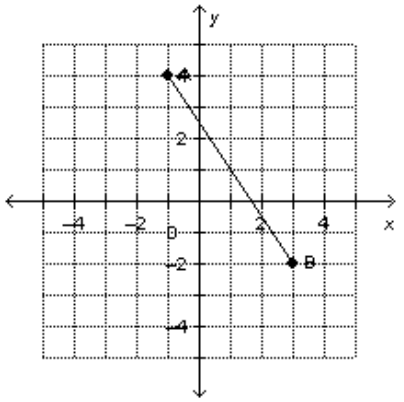
24. A line has a slope of -4.

c) What is the slope of a line that is parallel to this one?

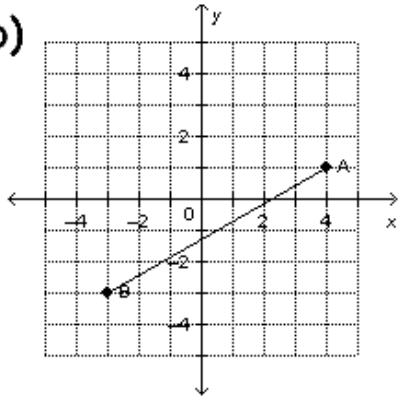
d) What is the slope of a line that is perpendicular to this one?

25. Determine the slope from the following graphs.

a)



b)



Level 3

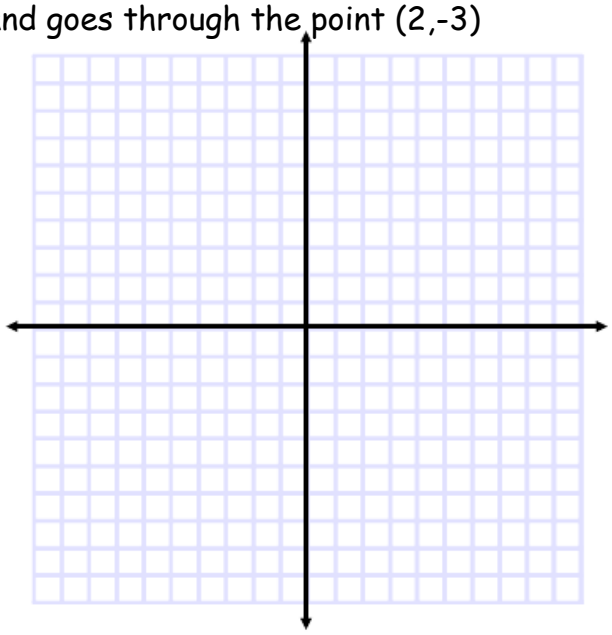
26. Determine the slope of a line that passes through the following points.

a) (-6, 8) and (-1, -2) b) (-3, 7) and (5, -5)

27. The equations of two lines are given. Are the two lines parallel, perpendicular or neither? Explain your reasoning.

a) y = -3x + 6 y = $\frac{1}{3}x - 20$

28. Draw a line segment that has a slope of $\frac{-3}{4}$ and goes through the point (2,-3)



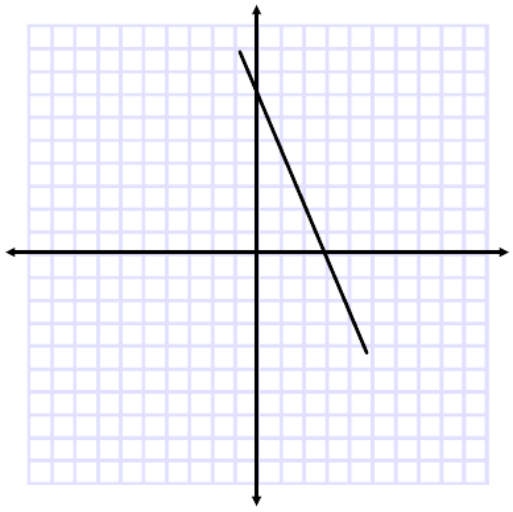
Outcome 8a

Level 2

29. State whether the following represent a linear relation.

a) $2x + 3y = 7$ b)$\{(2,7), (4,10), (6,13), (8,16)\}$ c) $x = -4$

30. What are the coordinates of the:



x intercept:

y intercept:

Level 3

31. If $g(x) = 2x - 4$, determine:

a) g(-1) b) x if g(x) = 2

32. Calculate the x and y intercepts for each of the equations:

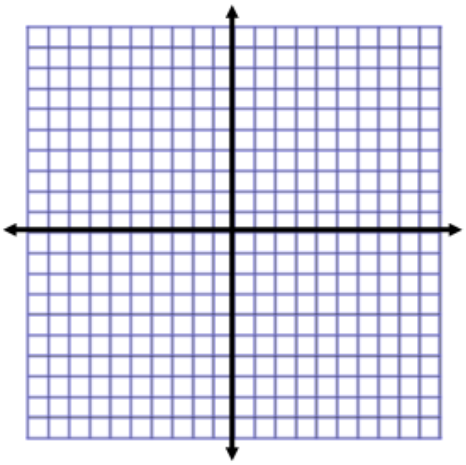
a) $2x - 5y = 20$ 2) $7y + 4x + 56 = 0$

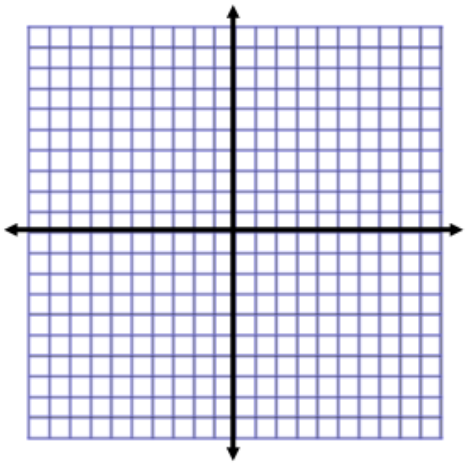
Outcome 8b
Level 3
33. Graph the following equations

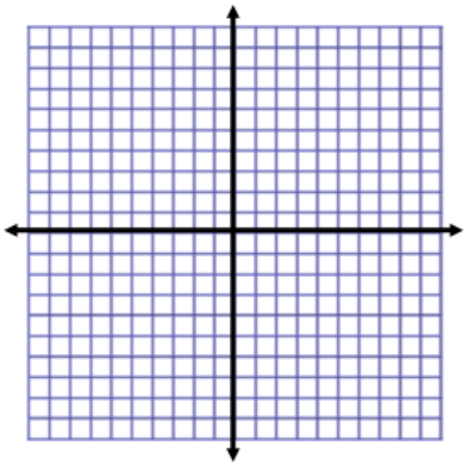
a) y = -3x – 2

b) 2x + y – 3 = 0

c) 4x + 3y – 24 = 0



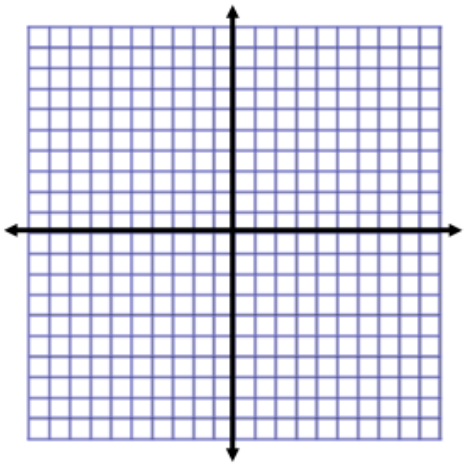


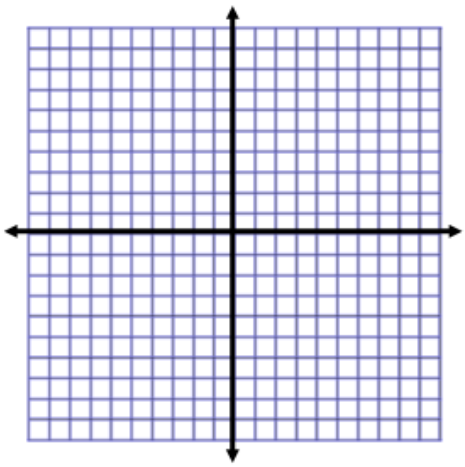


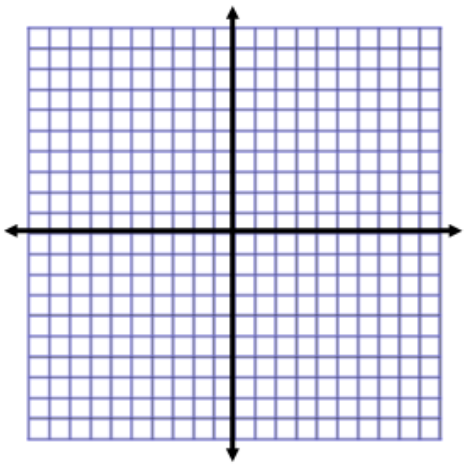
d) y = $\frac{5}{2}x + 1$

e) 2x – 3y = 6

f) – 5x + 3y + 9 = 0







Outcome 9

Level 2

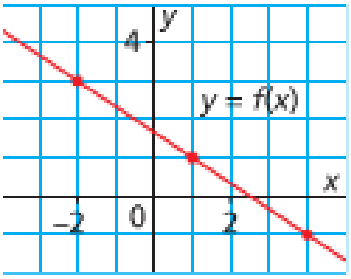
34. Write an equation of a line that has a slope of – 4 and a y-intercept of 9.

35. Write an equation of a line that has a slope of $\frac{-2}{3}$ and passes through the point (-2,5).

Level 3

36. Write an equation for each graph. Do not use estimates in our equations.

a)



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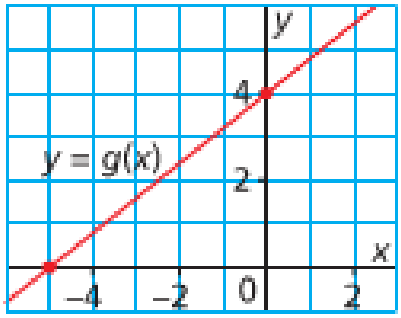


37. Write an equation in *slope-intercept form* that:

a) has slope 3 and passes through M(2, -5)

b) has slope -4 and passes through N(1, 4)

c) passes through (-3, 5) and (-1, 2)

d) is parallel to $y = -\frac{1}{3}x - 7$ and has an x-intercept of -3

38. Write an equation in <u>general form</u> that:

a) passes through the points (2, 3) and (-4, 5)

b) passes through the points (1, 4) and (5, 6)

c) has slope 2 and passes through (3, 6)

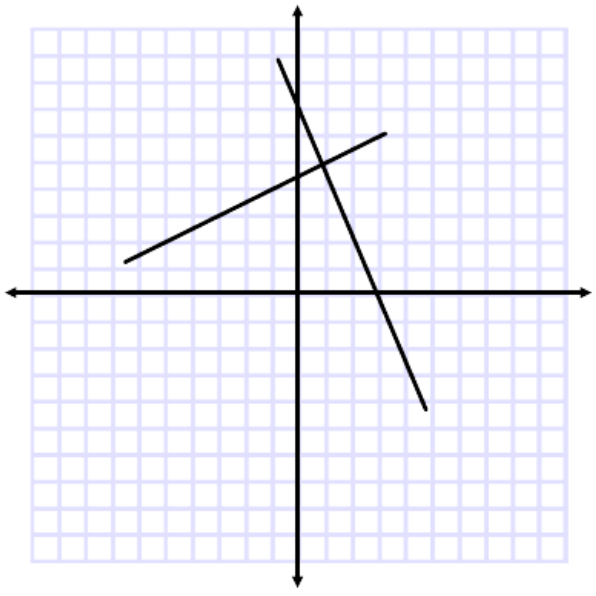
d) has a slope of 2/3 and passes through (-1, 4)

e) is perpendicular to $y - 4 = 2(x + 7)$ and passes through the point (-3, -5)

Outcome 10

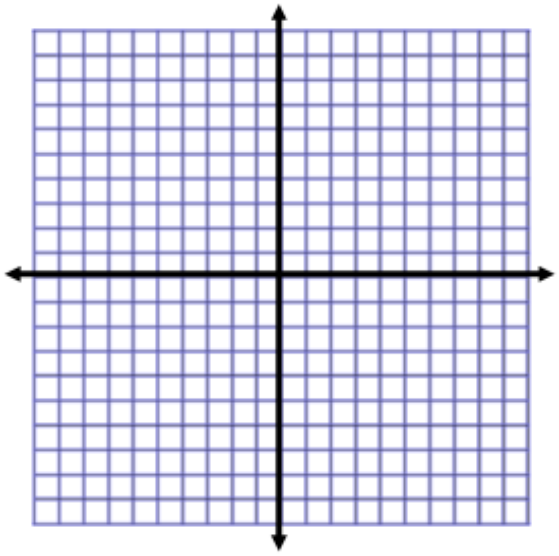
Level 2/3

39. Determine the solution to the system of equations.

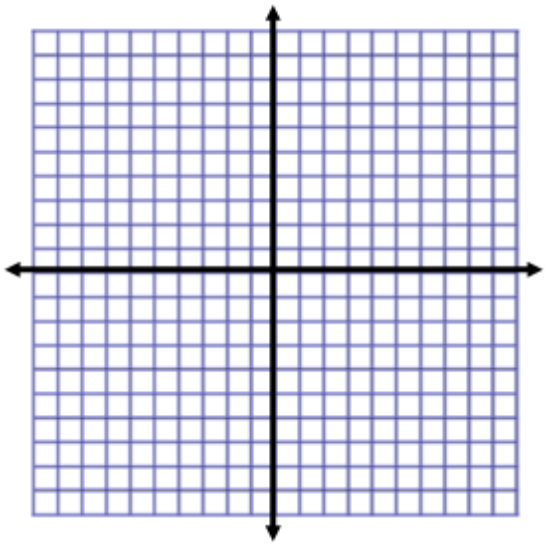


40. Solve the following systems graphically.

a) $x - y = 3$
$2x + y = 6$



b) $y = -x + 5$
$y = 2x - 1$



41. Solve the following systems using substitution

a) $x + y = -5$
$x + 3y = -15$

b) $4x + y = -5$
$2x + 3y = 5$

c) $7x + y - 10 = 0$
$3x - 2y = -3$

42. Solve the following systems using elimination

a) $-3x - y = 5$
$2x + y = -5$

b) $2x - 4y = 13$
$4x - 5y = 8$

c) $-0.5x + 0.2y = -1$
$0.3x - 0.6y = -1.8$

43. Determine the number of solutions of each system

a) $y = 3x - 2$
$y = -4x + 5$

b) $4x - 2y = -0.2$
$-x + 0.5y = 0.05$

c) $y = 3x - 2$
$y = 3x + 2$

44. Determine if each point is a solution to the system.

a) (-2, 3)

$2x - y = -7$

$3x + y = 7$

b) (1, -1)

$3x - 4y = 7$

$9x + 6y = 3$

d) (4, -3)

$2x - y = 11$

$x + 2y = -2$