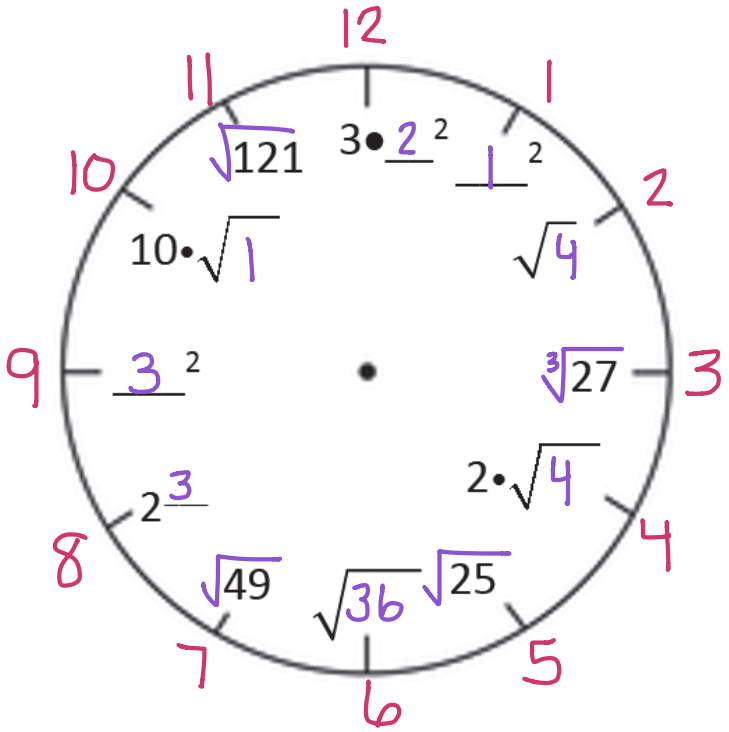
NAME: _____ PERIOD: _____ DATE: _____

# Homework Problem Set

1. Beth bought a new clock but it was missing a few numbers and symbols. Draw in the symbols or write in the numbers needed to make this equivalent to a normal clock.




2. Use the numbers in the number bank to fill in the chart. Some numbers will satisfy more than one cell, but each number can only be used once.

| | Odd | Even | Multiple of three |
|---|---|---|---|
| Prime | 17 | 2 | 3 |
| Square | 25 | 16 | 9 |
| Factors of 168 | 21 | 14 | 24 |

| Number Bank |
|---|
| 2 |
| 3 |
| 9 |
| 14 |
| 16 |
| 17 |
| 21 |
| 24 |
| 25 |

Source: http://www.transum.org/Software/sw/Starter_of_the_day/Students/Satisfy.asp?Level=2

3. What does $\sqrt{16}$ equal?

4

4. What does $\sqrt{36}$ equal?

6

5. What does $4 \times 4$ equal?

16

6. What does $6 \times 6$ equal?

36

7. Does $\sqrt{16} = \sqrt{4 \times 4}$?

yes

8. Does $\sqrt{36} = \sqrt{6 \times 6}$?

yes

9. Rewrite $\sqrt{20}$ using at least one perfect square factor.

$\sqrt{2 \cdot 2 \cdot 5} = 2\sqrt{5}$

10. Rewrite $\sqrt{28}$ using at least one perfect square factor.

$\sqrt{2 \cdot 2 \cdot 7} = 2\sqrt{7}$

**Simplify the square roots as much as possible.**

11. $\sqrt{18}$

$\sqrt{2 \cdot 3 \cdot 3}$

$3\sqrt{2}$

12. $\sqrt{44}$

$\sqrt{2 \cdot 2 \cdot 11}$

$2\sqrt{11}$

13. $\sqrt{169}$

$\sqrt{13 \cdot 13}$

13

14. $\sqrt{75}$

$\sqrt{3 \cdot 5 \cdot 5}$

$5\sqrt{3}$

15. $\sqrt{128}$

$\sqrt{2 \cdot 8 \cdot 8}$

$8\sqrt{2}$

16. $\sqrt{250}$

$\sqrt{5 \cdot 5 \cdot 10}$

$5\sqrt{10}$

17. $\sqrt{12}$ $\sqrt{3}\cdot\sqrt{4}$

$2\sqrt{3}$

18. $\sqrt{144}$

$\sqrt{12\cdot12}$

12

19. $\sqrt{98}$

$\sqrt{2\cdot7\cdot7}$

$7\sqrt{2}$

98 → 2, 49 → 7, 7

20. $\sqrt{343}$ $=\sqrt{7}\cdot\sqrt{49}$

$7\sqrt{7}$

21. $\sqrt{72ab^2c^4}$

$\sqrt{2\cdot2\cdot2\cdot3\cdot3\cdot a\cdot b\cdot b\cdot c\cdot c\cdot c\cdot c}$

$6bc^2\sqrt{2a}$

22. $\sqrt{175w^4v^3}$

$\sqrt{5\cdot5\cdot7\cdot w\cdot w\cdot w\cdot w\cdot v\cdot v\cdot v}$

$5w^2v\sqrt{7v}$

23. $\sqrt{80a^3}$ $=\sqrt{16}\cdot\sqrt{5}$

$4a\sqrt{5a}$

24. $\sqrt{256}$ $=\sqrt{4}\cdot\sqrt{64}$

16

25. $\sqrt{56x^3y^2}$ $=\sqrt{4}\cdot\sqrt{14}$

$2xy\sqrt{14x}$

26. $\sqrt{16}$

4

27. $\sqrt{200xyz^2}$ $\sqrt{2}\cdot\sqrt{100}$

$10z\sqrt{2xy}$

28. $\sqrt{45}$ $\sqrt{9}\cdot\sqrt{5}$

$3\sqrt{5}$

29. Josue simplified $\sqrt{450}$ as $15\sqrt{2}$. Is he correct? Explain why or why not.

yes, because $15\times15=225 \rightarrow \sqrt{225}\cdot\sqrt{2}=\sqrt{450}$

30. Tiah was absent from school the day that you learned how to simplify a square root. Using $\sqrt{360}$, write Tiah an explanation for simplifying square roots.

$\sqrt{360}=\sqrt{6\cdot6\cdot10}$
$=6\sqrt{10}$

OR

$\sqrt{360}=\sqrt{36}\cdot\sqrt{10}$
$=6\sqrt{10}$

*Reminder
$\sqrt{ab}=\sqrt{a}\cdot\sqrt{b}$

31. Simplify $\sqrt{100 \cdot 9 \cdot 16}$

$\sqrt{100} \cdot \sqrt{9} \cdot \sqrt{16}$

$10 \cdot 3 \cdot 4 = 120$

32. Simplify $\sqrt[3]{8 \cdot (-1) \cdot 27}$

$\sqrt[3]{8} \cdot \sqrt[3]{(-1)} \cdot \sqrt[3]{27}$

$2 \cdot -1 \cdot 3 =$

$-6$

33. Simplify $\sqrt{45x^2y}$

$\sqrt{9} \cdot \sqrt{5} \cdot x \cdot x \cdot y$

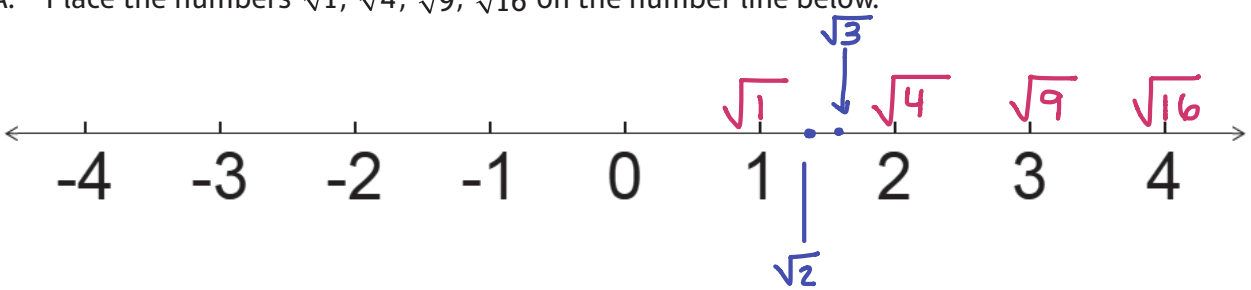
$3x\sqrt{5y}$

34. Simplify $\sqrt[3]{54x^3y^4}$

$\sqrt[3]{27} \cdot \sqrt[3]{2} \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y$

$3xy\sqrt[3]{2y}$

35. A. Place the numbers $\sqrt{1}$, $\sqrt{4}$, $\sqrt{9}$, $\sqrt{16}$ on the number line below.




B. Place the numbers $\sqrt{2}$ and $\sqrt{3}$ on the number line. Between what two integers do these numbers fall?

$\sqrt{1}$ $\sqrt{4}$

1 2

C. How could we represent $-3$ with a radical? Is there any other way to represent $-3$ with a radical?

$-\sqrt{9} = -3$ OR $\sqrt[3]{-27} = -3$

**For Problems 36–44, determine if each equation is True or False.**

36. $\sqrt{64} = 2^3$

$8 = 8$

TRUE

37. $\sqrt{8} = 2^{\frac{3}{2}}$

$\sqrt{8} = \sqrt{2^3}$

$\sqrt{8} = \sqrt{8}$

TRUE

38. $\sqrt{50} = 25\sqrt{2}$

$(25)^2 \cdot 2 = 1250$

$\sqrt{50} = \sqrt{1250}$

FALSE

39. $4^{\frac{3}{4}} = 64^{\frac{1}{4}}$

$\sqrt[4]{4^3} = \sqrt[4]{64}$

$\sqrt[4]{64} = \sqrt[4]{64}$

TRUE

40. $6^{\frac{3}{2}} = 6\sqrt{6}$

$6^{\frac{3}{2}} = \sqrt{6 \cdot 6 \cdot 6}$

$6^{\frac{3}{2}} = 6^{\frac{3}{2}}$

TRUE

41. $\sqrt{98} = 7 \cdot 2^{\frac{1}{2}}$

$7\sqrt{2} = 7\sqrt{2}$

TRUE

42. $16^{\frac{3}{8}} = 2 \cdot 2^{\frac{1}{2}}$

$2^{\frac{3}{2}}$

$\sqrt[8]{16^3} = \sqrt[8]{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$

$= 2^{\frac{12}{8}} = 2^{\frac{3}{2}}$

$2^{\frac{3}{2}} = 2^{\frac{3}{2}}$ TRUE

43. $\sqrt[3]{125} = \sqrt{25}$

$\sqrt[3]{5 \cdot 5 \cdot 5} = 5$

$5 = 5$

TRUE

44. $\sqrt{200} = 10 \cdot 2^{\frac{1}{2}}$

$10\sqrt{2} = 10\sqrt{2}$

TRUE

**Simplify each expression.**

45. $\sqrt[3]{250a^5}$

$\sqrt[3]{5 \cdot 5 \cdot 5 \cdot 2 \cdot a \cdot a \cdot a \cdot a \cdot a}$

$5a\sqrt[3]{2a^2}$

46. $\sqrt[3]{135m^8}$

$\sqrt[3]{3 \cdot 3 \cdot 3 \cdot 5 \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m}$

OR

$\sqrt[3]{3^3} \cdot \sqrt[3]{5} \cdot \sqrt[3]{m^3} \cdot \sqrt[3]{m^3} \cdot \sqrt[3]{m^2}$

$3m^2\sqrt[3]{5m^2}$

47. $\sqrt[3]{-448n^2}$

$-4\sqrt[3]{7n^2}$

48. $\sqrt[3]{-40x^4}$

$-2\sqrt[3]{5 \cdot x^4}$

49. $2\sqrt[3]{320n^8}$

$8n^2\sqrt[3]{5n^2}$

50. $-3\sqrt[3]{-216x^3}$

$-3 \quad \sqrt[3]{-6^3} \quad \cdot \sqrt[3]{x^3}$

$\downarrow \qquad \downarrow$

$-3 \cdot -6 \cdot x$

$18x$

51. $\sqrt[5]{64x^6y^8}$

$= \sqrt[5]{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot x^5 \cdot x \cdot y^5 \cdot y^3}$

$= 2xy\sqrt[5]{2xy^3}$

52. $\sqrt[4]{1250a^3b^8}$

$= \sqrt[4]{5 \cdot 5 \cdot 5 \cdot 5 \cdot 2 \cdot a^3 \cdot b^4 \cdot b^4}$

$= 5b^2\sqrt[4]{2a^3}$

53. $2\sqrt[4]{768a^7b^5}$

$8ab\sqrt[4]{3ab}$

54. $\sqrt[5]{96n^3m^5}$

$2m\sqrt[5]{3n^3}$

55. $-\sqrt[3]{-40a^3b^6}$

$2ab^2\sqrt[3]{5}$

56. $\sqrt[5]{x^{25}y^{17}z^3}$

$x^5y^3\sqrt[5]{y^2z^3}$