

Name:

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Perform the indicated operation on the numbers listed in the columns.

x	x^2	x	$3x$	x	$7x$	x	$9x$
1		5		8		0	
2		9		2		9	
3		3		12		7	
4		6		5		5	
5		7		10		3	
6		10		6		10	
7		11		7		8	
8		12		11		6	
9		2		3		2	
10		8		4		11	
11		0		1		9	
12		5		5		5	
13		6		9		0	
14		8		2		1	
15		9		7		3	

- 1) Seven times a number added to 5 is 40.
- 2) A number minus 72 is 8.
- 3) Fifty-eight less than a number equals -5.
- 4) Seven more than 3 times a number is 31.
- 5) Twice the sum of a certain number and 58 is 120.
- 6) Ten times the sum of a number and 7 is 90.
- 7) Two less than twelve times a number is 10.
- 8) Fifteen less than twice a number is -3.
- 9) The sum of 34 and a number is 54.
- 10) The sum of a number and seven times the same number is 56.
- 11) Sixty-four less than a number equals -8.
- 12) Five times a number, less 10 is 20.
- 13) Ten less than the product of 9 and a number is 17.

- 14) The sum of 9 and the product of 4 and a number is 37.
- 15) Seven times a number equals 28.
- 16) Twice the sum of a certain number and 43 is 94.
- 17) The sum of 37 and a number is 67.
- 18) Seven times a number added to 5 is 19.
- 19) Ten less than the product of 6 and a number is 44.
- 20) Thirteen less than twice a number is -3.
- 21) Sixty-three less than a number equals -57.
- 22) The sum of a number and seven times the same number is 32.
- 23) Six times a number, less 2 is 70.
- 24) The sum of 10 and the product of 9 and a number is 37.
- 25) Four times the sum of a number and 2 is 48.

Name _____



Date _____

Percents

(Answer ID # 0637514)

Complete. Round your answer to the nearest tenth.

1. 45 is 30% of what number?	2. What percent of 270 is 513?
3. What number is 8% of 450?	4. 248 is 80% of what number?
5. 60% of what number is 42?	6. 32 is what percent of 160?
7. 160% of what number is 752?	8. What percent of 150 is 105?
9. What number is 160% of 240?	10. 28% of 300 is what number?
11. 60% of 180 is what number?	12. 34.76 is what percent of 22?
13. 26 is 50% of what number?	14. 136 is what percent of 80?
15. 256% of what number is 23124.48?	16. 60% of 280 is what number?
17. 100% of what number is 12?	18. 393% of 29 is what number?
19. What number is 180% of 380?	20. What percent of 180 is 108?
21. 91.78 is 353% of what number?	22. What number is 10% of 480?
23. What percent of 420 is 651?	24. 234 is what percent of 390?
25. 416 is what percent of 320?	26. 403.2 is 105% of what number?
27. What percent of 9011 is 25861.57?	28. 99 is 30% of what number?
29. 324 is what percent of 180?	30. 206% of what number is 920.82?
31. What number is 120% of 395?	32. 80% of 110 is what number?
33. 164% of 75 is what number?	34. What percent of 350 is 329?
35. What number is 370% of 67?	36. 142% of what number is 231.46?
37. 20% of what number is 30?	38. 153 is what percent of 150?
39. What number is 60% of 200?	40. 29415.05 is 367% of what number?

Answer Key 0637514

1. 45 is 30% of what number? 150	2. What percent of 270 is 513? 190%
3. What number is 8% of 450? 36	4. 248 is 80% of what number? 310
5. 60% of what number is 42? 70	6. 32 is what percent of 160? 20%
7. 160% of what number is 752?	8. What percent of 150 is 105?

470	70%
9. What number is 160% of 240? 384	10. 28% of 300 is what number? 84
11. 60% of 180 is what number? 108	12. 34.76 is what percent of 22? 158%
13. 26 is 50% of what number? 52	14. 136 is what percent of 80? 170%
15. 256% of what number is 23124.48? 9033	16. 60% of 280 is what number? 168
17. 100% of what number is 12? 12	18. 393% of 29 is what number? 113.97 rounded to 114
19. What number is 180% of 380? 684	20. What percent of 180 is 108? 60%

Answer Key 0637514

21. 91.78 is 353% of what number? 26	22. What number is 10% of 480? 48
23. What percent of 420 is 651? 155%	24. 234 is what percent of 390? 60%
25. 416 is what percent of 320? 130%	26. 403.2 is 105% of what number? 384
27. What percent of 9011 is 25861.57? 287%	28. 99 is 30% of what number? 330
29. 324 is what percent of 180? 180%	30. 206% of what number is 920.82? 447
31. What number is 120% of 395? 474	32. 80% of 110 is what number? 88
33. 164% of 75 is what number? 123	34. What percent of 350 is 329? 94%
35. What number is 370% of 67? 247.9	36. 142% of what number is 231.46? 162.99 rounded to 163

247.9	163
37. 20% of what number is 30?	38. 153 is what percent of 150?
150	102%
39. What number is 60% of 200?	40. 29415.05 is 367% of what number?
120	8015

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Similar Triangles

Complete.

<p>1. Triangles CDE and IJK are similar. $CE:IK = 2:6$, and $JK = 78$, what is the length of DE?</p>	<p>2. Triangles FGH and MNO are similar. The perimeter of smaller triangle FGH is 77. The lengths of two corresponding sides on the triangles are 30 and 150. One side of MNO is 80. What is the length of the corresponding side on FGH?</p>
<p>3. A tree 46 feet tall casts a shadow 56 feet long. Amy is $5\frac{3}{4}$ feet tall. How long is Amy's shadow?</p>	<p>4. Triangles JKL and STU are similar. The length of the sides of JKL are $229 + x$, $10x - 62$, and $x + 221$. The perimeter of JKL is 808. The perimeter of STU is 707, what is the length of the longest side of STU?</p>
<p>5. Triangles BCD and GHI are similar. The length of the sides of BCD are $17x - 49$, $2x + 224$, and $14 + 13x$. The perimeter of BCD is 861. The length of the smallest side of GHI is $169 + x$, what is the length of the longest side of GHI?</p>	<p>6. Triangles EFG and KLM are similar. The perimeter of smaller triangle EFG is 86. The lengths of two corresponding sides on the triangles are 33 and 132. What is the perimeter of KLM?</p>
<p>7. Triangles KLM and UVW are similar. The length of the sides of KLM are $8 + 3x$, $2x + 96$, and $92 + 2x$. The perimeter of KLM is 476. The length of the longest side of UVW is $24 + 6x$, what is the perimeter of UVW?</p>	<p>8. Triangles HIJ and TUV are similar. The perimeter of smaller triangle HIJ is 135. The lengths of two corresponding sides on the triangles are 45 and 270. What is the perimeter of TUV?</p>
<p>9. Triangles KLM and STU are similar. The length of the sides of KLM are $x + 82$, $4x - 26$, and $5x - 90$. The perimeter of KLM is 306. The perimeter of STU is 459, what is the length of the longest side of STU?</p>	<p>10. Triangles IJK and RST are similar. The perimeter of smaller triangle IJK is 126. The lengths of two corresponding sides on the triangles are 38 and 152. One side of RST is 172. What is the length of the corresponding side on IJK?</p>

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Date _____

Similar Triangles

Complete.

<p>1.</p> <p> $m\angle B \cong \angle E$ $m\angle A \cong \angle F$ $AC:FD = 6:12$, and $ED = 156$, what is the length of BC? </p>	<p>2.</p> <p> $m\angle C \cong \angle F$ $m\angle A \cong \angle D$ The perimeter of smaller triangle ABC is 56. The lengths of two corresponding sides on the triangles are 23 and 138. What is the perimeter of DEF? </p>
<p>3.</p> <p> $m\angle B \cong \angle E$ The length of the sides of ABC are 175, 203, and 210. The length of the smallest side of DEC is 50, what is the length of the longest side of DEC? </p>	<p>4.</p> <p> $m\angle A \cong \angle F$ $m\angle B \cong \angle E$ The length of the sides of ABC are 88, 156, and 100. The perimeter of FED is 172, what is the length of the longest side of FED? </p>
<p>5.</p> <p> $m\angle C \cong \angle E$ </p>	<p>6.</p>

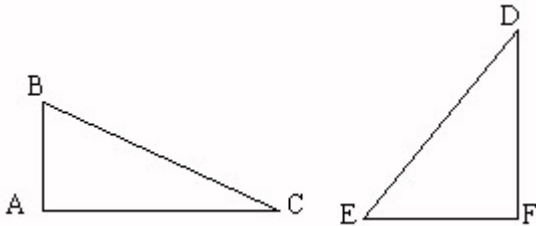
$$m\angle B \cong \angle D$$

The perimeter of smaller triangle ABC is 80. The lengths of two corresponding sides on the triangles are 33 and 165. One side of ADE is 105. What is the length of the corresponding side on ABC?

$$m\angle B \cong \angle E$$

The perimeter of smaller triangle ABC is 117. The lengths of two corresponding sides on the triangles are 44 and 220.

7.

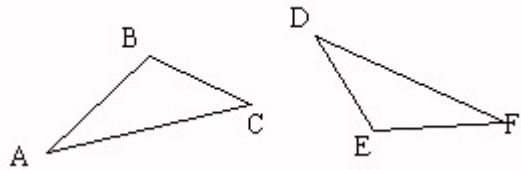


$$m\angle A \cong \angle F$$

$$m\angle B \cong \angle E$$

The length of the sides of ABC are 60, 74, and 78. The length of the longest side of FED is 468, what is the perimeter of FED?

8.

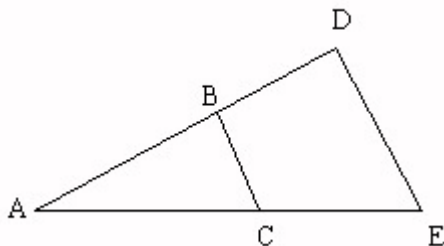


$$m\angle B \cong \angle E$$

$$m\angle A \cong \angle D$$

The perimeter of smaller triangle ABC is 134. The lengths of two corresponding sides on the triangles are 48 and 240. One side of DEF is 235. What is the length of the corresponding side on ABC?

9.

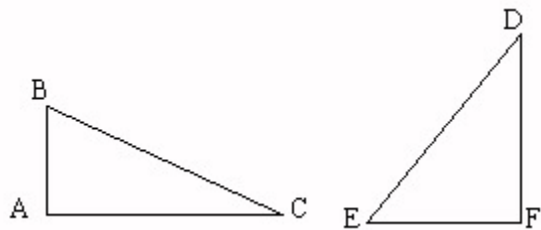


$$m\angle A \cong \angle A$$

$$m\angle C \cong \angle E$$

The length of the sides of ABC are 220, 204, and 216. The length of the smallest side of ADE is 408, what is the length of the longest side of ADE?

10.



$$m\angle B \cong \angle E$$

$$m\angle A \cong \angle F$$

The perimeter of smaller triangle ABC is 183. The lengths of two corresponding sides on the triangles are 67 and 335.

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Date _____

Similar Triangles

Complete.

<p>1. Triangles HIJ and MNO are similar. The perimeter of smaller triangle HIJ is 44. The lengths of two corresponding sides on the triangles are 13 and 26. What is the perimeter of MNO?</p>	<p>2. Triangles ABC and HIJ are similar. The length of the sides of ABC are 102, 162, and 96. The length of the smallest side of HIJ is 32, what is the length of the longest side of HIJ?</p>
<p>3. Triangles IJK and TUV are similar. The length of the sides of IJK are 203, 154, and 196. The length of the longest side of TUV is 348, what is the perimeter of TUV?</p>	<p>4. Triangles EFG and RST are similar. The perimeter of smaller triangle EFG is 96. The lengths of two corresponding sides on the triangles are 34 and 170. One side of RST is 180. What is the length of the corresponding side on EFG?</p>
<p>5. Triangles GHI and MNO are similar. $GI:MO = 4:3$, and $MN = 87$, what is the length of GH?</p>	<p>6. Triangles JKL and RST are similar. The length of the sides of JKL are 170, 230, and 205. The perimeter of RST is 726, what is the length of the longest side of RST?</p>
<p>7. A tree 42 feet tall casts a shadow 120 feet long. Paul is $3\frac{1}{2}$ feet tall. How long is Paul's shadow?</p>	<p>8. Triangles BCD and UVW are similar. The perimeter of smaller triangle BCD is 104. The lengths of two corresponding sides on the triangles are 31 and 186. One side of UVW is 192. What is the length of the corresponding side on BCD?</p>
<p>9. Triangles DEF and TUV are similar. The length of the sides of DEF are 215, 260, and 265. The length of the smallest side of TUV is 129, what is the length of the longest side of TUV?</p>	<p>10. Triangles FGH and UVW are similar. The perimeter of smaller triangle FGH is 155. The lengths of two corresponding sides on the triangles are 55 and 110. What is the perimeter of UVW?</p>

Review of Decimal Numbers

Name _____ Date _____

1. Write the following as a decimal numeral:
 - a) sixteen tenths
 - b) nine hundredths
 - c) five hundred and forty-three thousandths
 - d) eight and five tenths
 - e) seven thousand eight hundred twenty-two thousandths
2. Round:
 - a) 24.137 to the nearest tenth
 - b) .96 to the nearest tenth
 - c) 8.2915 to the nearest hundredth
 - d) 25.1427 to the nearest thousandth
 - e) \$4.279 to the nearest cent
3. Add:
 - a) $8.2 + .19 + 24$
 - b) Find the sum of : 49.2, .871, and 6.45
 - c) $\$6.21 + \$58.14 + \$.68 + \$9.85 + \$180.07$
 - d) $8.05 + .206 + 50.4 + 1.08 + 0.0001$
4. Subtract:
 - a) $.489 - .3$
 - b) $.8 - .375$
 - c) $10 - .04$
 - d) $7.25 - 5.004$
5. Subtract \$3.25 from \$28.
6. Which is greater:
 - a) .8 or .62?
 - b) 1.06 or .305?
7. Which is smaller:
 - a) .425 or .94?
 - b) 2.9 or .49?
8. Multiply:
 - a) $12.2(.021)$
 - b) $.04(.2)$
 - c) $90.72(.125)$
 - d) $.018(.05)$
 - e) $.75(\$5.26)$
9. Divide:
 - a) $.624 \div 7.8$
 - b) $11.076 \div 1.2$
 - c) $35 \div .875$
 - d) $\$2 \div \$.04$
 - e) $582 \div 39.37$
10. Multiply by short method:
 - a) $100(90)$
 - b) $10(3.56)$
 - c) $1,000(.4)$
 - d) $1,000(28.95)$
 - e) $10(3.56)$
 - f) $100(.08)$
11. Divide by short method:
 - a) $500 \div 10$
 - b) $240 \div 1,000$
 - c) $0.7 \div 100$
 - d) $93.2 \div 1,000$
 - e) $654 \div 100$
12. Find the cost of 940 liters of fuel oil at \$0.324 per liter.
 - a) \$305.66
 - b) \$303.56
 - c) \$298.76
 - d) answer not given
13. A basketball player scored 871 points in 56 games. Find the number of points averaged per game to the nearest tenth of a point.
 - a) 15.4
 - b) 15.7
 - c) 15.5
 - d) 15.6
14. The best batter in the American League had a batting average of 0.349. The leading batter in the National League had an average of 0.355. Who had the higher average and how much higher?
 - a) National League, 0.060
 - b) National League, 0.006
 - c) National League, 0.014
 - d) answer not given
15. The distance by train from St. Louis to Indianapolis is 240 miles, from Indianapolis to Dayton is 109.7 miles, from Dayton to Columbus is 70.7 miles, and from Columbus to Pittsburgh is 109.9 miles. What is the distance by train from St. Louis to Pittsburgh by this route?
16. If the tax rate is \$2.95 per \$100, how much must you pay for taxes on a house assessed for \$29,800?
17. A merchant bought 150 pounds of pears for \$37.50. He sold 67 pounds at \$0.49 a pound, 48 pounds at \$0.39 a pound, and 29 pounds at \$0.25 a pound. The rest spoiled. How much profit did he make?

Name _____

Date _____

Geometry Word Problems

(Answer ID # 0732524)

Solve each problem.

1. Find the perimeter of a regular heptagon if the length of a side is 5 mm	2. Express in terms of x the perimeter of a regular pentagon if the length of a side is represented by $9x - 72$
3. The length of a side of a regular quadrilateral is $94 + x$. If the perimeter is 392, solve for x .	4. Find the perimeter of a regular octagon if the length of a side is 5 m
5. Express in terms of x the perimeter of a regular octagon if the length of a side is represented by $7x$	6. The length of a side of a regular hexagon is $24x - 20$. If the perimeter is 600, solve for x .
7. Find the perimeter of a regular pentagon if the length of a side is 31 mm	8. The length of a side of a regular heptagon is $x + 119$. If the perimeter is 924, solve for x .
9. Express in terms of x the perimeter of a regular decagon if the length of a side is represented by $10x - 37$	10. The length of a side of a regular pentagon is $124 + x$. If the perimeter is 685, solve for x .

Name:

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Perform the indicated operation on the numbers listed in the columns.

x	x^2	x	$3x$	x	$7x$	x	$9x$
1	1	5	15	8	56	0	0
2	4	9	27	2	14	9	81
3	9	3	9	12	84	7	63
4	16	6	18	5	35	5	45
5	25	7	21	10	70	3	27
6	36	10	30	6	42	10	90
7	49	11	33	7	49	8	72
8	64	12	36	11	77	6	54
9	81	2	6	3	21	2	18
10	100	8	24	4	28	11	99
11	121	0	0	1	7	9	81
12	144	5	15	5	35	5	45
13	169	6	18	9	63	0	0
14	196	8	24	2	14	1	9
15	225	9	27	7	49	3	27

Name _____



Date _____

Jessica is a farmer. She built four plots to grow vegetables (cucumber, cauliflower, broccoli, and cabbage). After preparing the plots, she forgot which plot is for which vegetable. She knew the width (11 m 50 cm, 14 m 80 cm, 8 m 40 cm, and 12 m 50 cm) and length (18 m 20 cm, 12 m 60 cm, 15 m 80 cm, and 16 m 60 cm) of the plots.

Figure out the length and width of each plot and the vegetable being grown in the plot.

Also figure out the area and perimeter of each plot.

1. The cauliflower plot has a perimeter of 48 m 40 cm.
2. The cabbage plot has the longest length.
3. The cucumber plot has an area of 207.5 m^2 .
4. The broccoli plot has the longest width.

Answer Key

Jessica is a farmer. She built four plots to grow vegetables (cucumber, cauliflower, broccoli, and cabbage). After preparing the plots, she forgot which plot is for which vegetable. She knew the width (11 m 50 cm, 14 m 80 cm, 8 m 40 cm, and 12 m 50 cm) and length (18 m 20 cm, 12 m 60 cm, 15 m 80 cm, and 16 m 60 cm) of the plots.

Figure out the length and width of each plot and the vegetable being grown in the plot.

Also figure out the area and perimeter of each plot.

cucumber width: 12 m 50 cm, length: 16 m 60 cm, perimeter: 58 m 20 cm, area: 207.5 m²

broccoli width: 14 m 80 cm, length: 12 m 60 cm, perimeter: 54 m 80 cm, area: 186.48 m²

cauliflower width: 8 m 40 cm, length: 15 m 80 cm, perimeter: 48 m 40 cm, area: 132.72 m²

cabbage width: 11 m 50 cm, length: 18 m 20 cm, perimeter: 59 m 40 cm, area: 209.3 m²

Name _____

Date _____
(Answer ID # 0893303)

Mixed Review

Complete.

1. 543.0004631 L = _____ cL	2. 64.8 L = _____ kL
3. 122,000,000 mL = _____ kL	4. 0.000029 kL = _____ cL
5. 267 L = _____ mL	6. 14.008 kL = _____ mL

Complete.

7. 477,000 mL = _____ L	8. 0.00017 kL = _____ mL
9. 79 mL = _____ cL	10. 0.0112 L = _____ kL
11. 249 kL = _____ mL	12. 63,300,000 cL = _____ kL

Complete.

13. 445,300 cL = _____ kL	14. 0.0002 kL = _____ mL
15. 53,100 cg = _____ g	16. 38,100,000 cm = _____ km
17. 0.066 cg = _____ mg	18. 594,000 m = _____ km

Complete.

19. $94 \text{ lb } 2\frac{3}{5} \text{ oz} + 89 \text{ lb } 11 \text{ oz}$	20. $96 \text{ lb } 2 \text{ oz} + 82 \text{ lb } 1\frac{7}{8} \text{ oz}$
21. $73 \text{ gal } \frac{1}{9} \text{ qt} - 5 \text{ gal } \frac{1}{2} \text{ qt}$	22. $36 \text{ c } 1 \text{ fl oz} - 6 \text{ c } 2\frac{1}{2} \text{ fl oz}$

Convert each quantity to the given units.

23. 26 T = _____ lb	24. 24,640 yd = _____ mi	25. 264 in = _____ ft
26. 272 pt = _____ gal	27. 33 mi = _____ ft	28. 192 fl oz = _____ qt
29. 33 gal = _____ qt	30. 42,000 lb = _____ T	31. 6 T = _____ oz

Complete.

32. 45.5 m = _____ km	33. 155 km = _____ mm
34. 269 kL = _____ cL	35. 248 cg = _____ mg
36. 522,000.034 mg = _____ g	37. 899,000 L = _____ kL

Complete.

38. 0.02435 cm = _____ m	39. 2.51 km = _____ mm
40. 325,000 m = _____ km	41. 950 km = _____ cm
42. 0.04 km = _____ cm	43. 925.00278 m = _____ mm

Complete the unit conversions.

44. 3 gallons to pints 3 gal • $\frac{\text{pt}}{\text{gal}}$ = _____ pints	45. 80 millimeters to centimeters 80 mm • $\frac{\text{cm}}{\text{mm}}$ = _____ centimeters
--	--

Answer Key 0893303

Complete.

--	--

Complete.

--	--

Complete.

--	--

Complete.

--	--

Convert each quantity to the given units.

--	--	--

Complete.

--	--

Complete.

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Complete the unit conversions.

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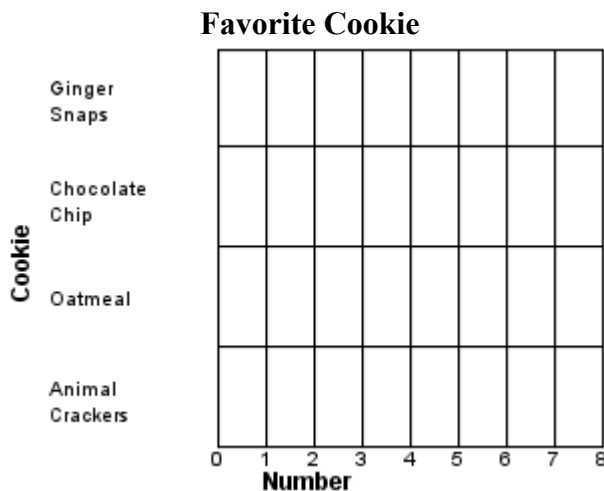
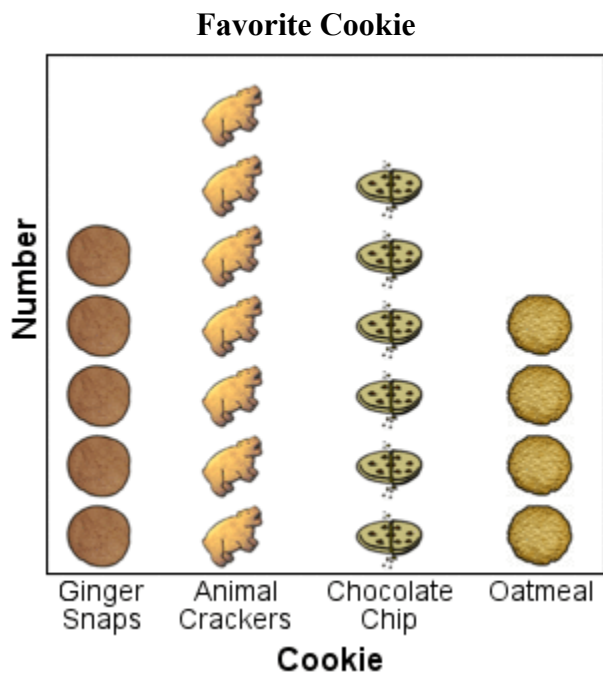
Name _____



Date _____
(Answer ID # 0214803)

Graphs

Use data from the picture graph to make a bar graph. Answer the questions.



- | | |
|---|---|
| <p>1. How many people answered the survey?</p> <p>_____</p> | <p>2. How many fewer people chose oatmeal than chose chocolate chip?</p> <p>_____</p> |
|---|---|

Use the table graph to answer the questions.

<p>3.</p> <p style="text-align: center;">Favorite Snack</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Snack</th> <th style="width: 15%;">Number</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> Chocolate</td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: center;"> Cookies</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;"> Nachos</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: center;"> Ice Cream</td> <td style="text-align: center;">5</td> </tr> </tbody> </table>	Snack	Number	Chocolate	7	Cookies	3	Nachos	6	Ice Cream	5	<p>a. How many people did not choose cookies as their favorite snack?</p> <p>_____</p> <p>b. What is the most popular snack?</p> <p>_____</p> <p>c. How many people chose either ice cream or chocolate?</p> <p>_____</p>
Snack	Number										
Chocolate	7										
Cookies	3										
Nachos	6										
Ice Cream	5										

Use the picture graph to answer the questions.

4. **Favorite Color**

Color	Number of Cookies
Yellow	7
Red	6
Pink	2
Blue	8

a. List the colors in order from the color with the most votes to the color with the fewest votes.

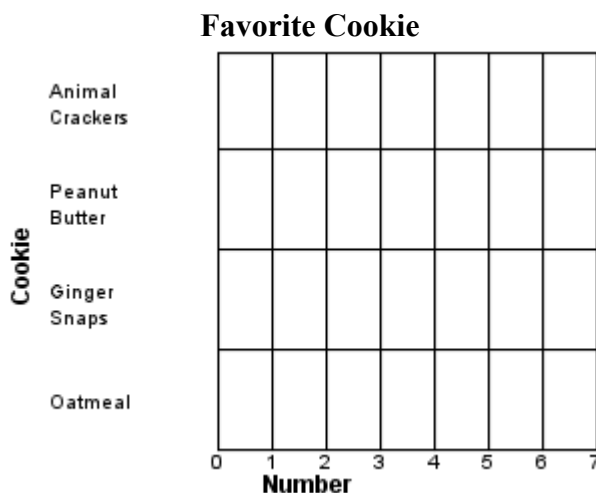
b. How many people answered the survey?

c. How many people chose pink as their favorite color?

Use data from the table graph to make a bar graph. Answer the questions.

Favorite Cookie

Cookie	Number
 Peanut Butter	4
 Ginger Snaps	2
 Oatmeal	5
 Animal Crackers	6



5. How many fewer people chose peanut butter than chose oatmeal?

6. List the cookies in order from the cookie with the fewest votes to the cookie with the most votes.

Use the tally table to answer the questions.

7.

Favorite Cookie

Cookie	Tally	Number
Chocolate Chip		2
Oatmeal		7
Peanut Butter		4
Animal Crackers		8
Ginger Snaps		6

a. How many fewer people chose chocolate chip than chose peanut butter?

b. How many people chose oatmeal as their favorite cookie?

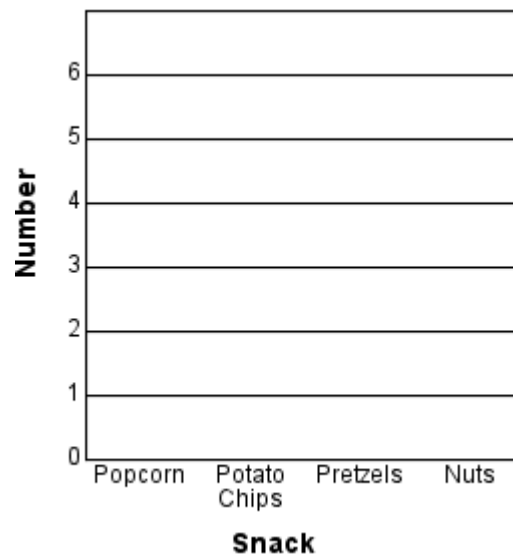
c. How many people did not choose peanut butter as their favorite cookie?

Use data from the tally table to make a bar graph. Answer the questions.

Favorite Snack

Snack	Tally	Number
Popcorn		6
Potato Chips		5
Pretzels		3
Nuts		4
Nachos		7
Crackers		2
Raisins		8

Favorite Snack



8. What is the least popular snack?

9. List the snacks in order from the snack with the most votes to the snack with the fewest votes.

Answer Key 0214803

1 How many people answered the survey?

22

2 How many fewer people chose oatmeal than chose chocolate chip?

2

3 a. How many people did not choose cookies as their favorite snack?

18

b. What is the most popular snack?

Chocolate

c. How many people chose either ice cream or chocolate?

12

4 a. List the colors in order from the color with the most votes to the color with the fewest votes.

Blue, Yellow, Red, Pink

b. How many people answered the survey?

23

c. How many people chose pink as their favorite color?

2

5 How many fewer people chose peanut butter than chose oatmeal?

1

6 List the cookies in order from the cookie with the fewest votes to the cookie with the most votes.

Ginger Snaps, Peanut Butter, Oatmeal, Animal Crackers

7 a. How many fewer people chose chocolate chip than chose peanut butter?

2

b. How many people chose oatmeal as their favorite cookie?

7

c. How many people did not choose peanut butter as their favorite cookie?

17

8 What is the least popular snack?

Pretzels

9 List the snacks in order from the snack with the most votes to the snack with the fewest votes.

Popcorn, Potato Chips, Nuts, Pretzels

Name _____

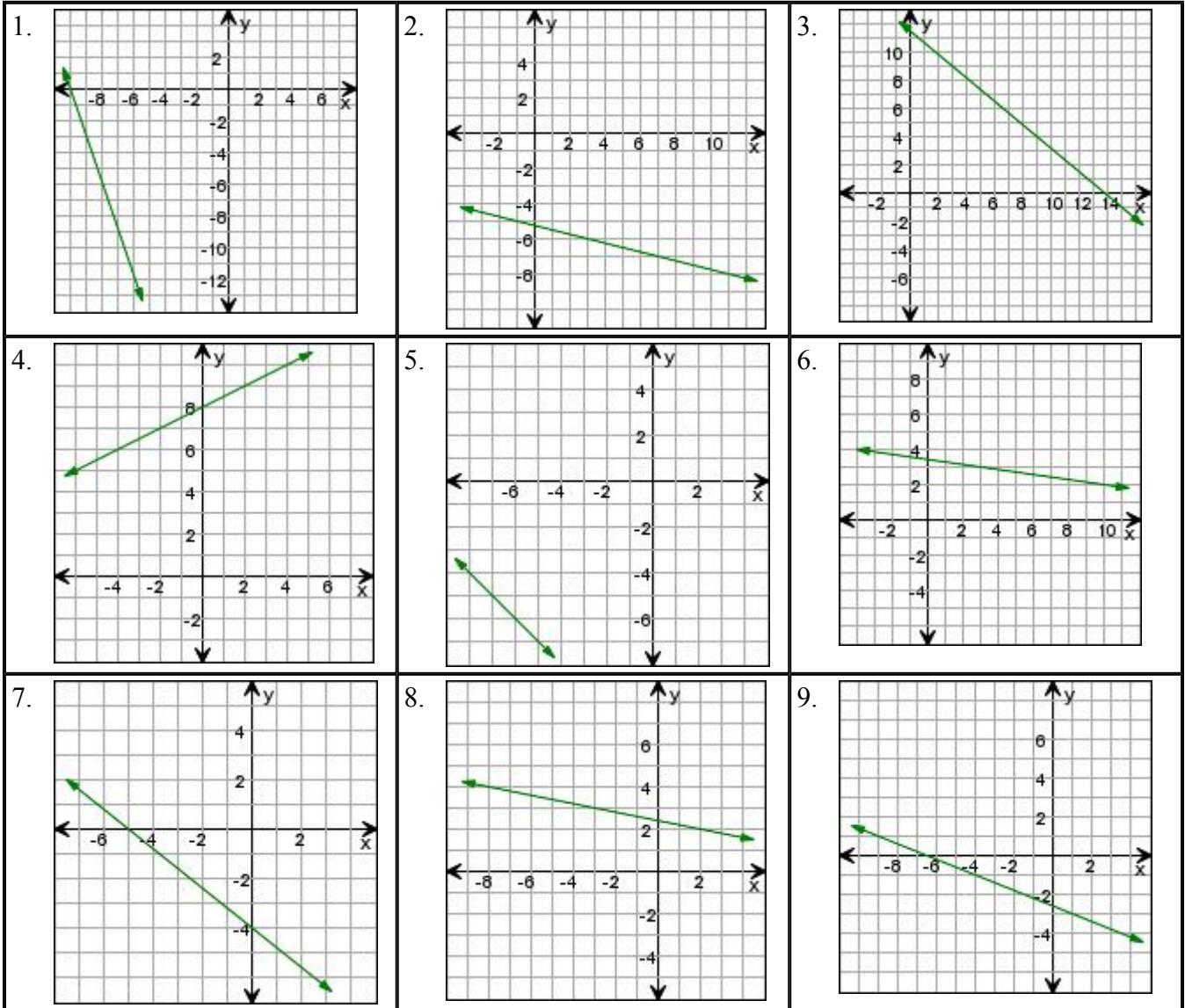


Date _____

Linear Equations

(Answer ID # 0337624)

Find the slope of the line.



Answer Key 0337624

$$\underline{1} -3$$

$$\underline{2} \frac{-1}{4}$$

$$\underline{3} \frac{-5}{6}$$

$$\underline{4} \frac{1}{2}$$

$$\underline{5} -1$$

$$\underline{6} \frac{-1}{7}$$

$$\underline{7} \frac{-4}{5}$$

$$\underline{8} \frac{-1}{5}$$

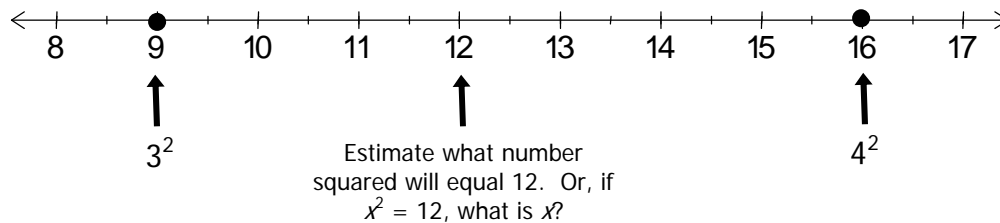
$$\underline{9} \frac{-2}{5}$$

Estimating Square Roots

In order to estimate the value of a square root you will need to be able to make a MENTAL list of the perfect squares. **If you have not already done so, you need to memorize these perfect square facts so you can make your mental list:**

$1^2 = 1$	$2^2 = 4$	$3^2 = 9$	$4^2 = 16$	$5^2 = 25$
$6^2 = 36$	$7^2 = 49$	$8^2 = 64$	$9^2 = 81$	$10^2 = 100$
$11^2 = 121$	$12^2 = 144$	$13^2 = 169$	$14^2 = 196$	$15^2 = 225$

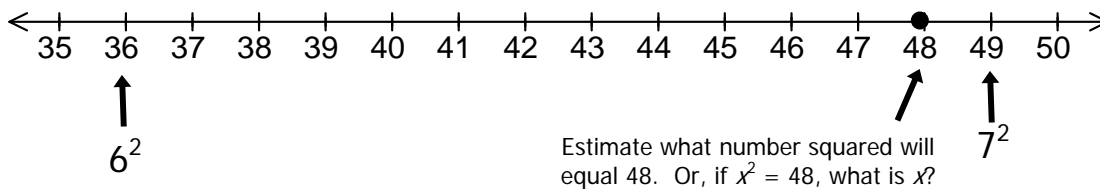
EXAMPLE 1: Estimate $\sqrt{12}$ without a calculator. We know that $3^2 = 9$ and $4^2 = 16$.



Since $9 < 12 < 16$, then $\sqrt{9} < \sqrt{12} < \sqrt{16}$. So $3 < \sqrt{12} < 4$.

We know the answer must be between 3 and 4. Since 12 is about $\frac{1}{2}$ way between 9 and 16 a good estimate of $\sqrt{12}$ would be 3.5.

EXAMPLE 2: Estimate $\sqrt{48}$ without a calculator. We know that $6^2 = 36$ and $7^2 = 49$.



Since $36 < 48 < 49$, then $\sqrt{36} < \sqrt{48} < \sqrt{49}$. So $6 < \sqrt{48} < 7$.

We know the answer must be between 6 and 7. But this time we can see that 48 is closer to 49 than to 36, so the answer must be closer to 7 than to 6. A good estimate of $\sqrt{48}$ would be 6.8 or 6.9.

PROBLEMS: Estimate the square root to the nearest tenth, as in the examples. Do not use a calculator.

1) $\sqrt{27}$	2) $\sqrt{5}$	3) $\sqrt{39}$	4) $\sqrt{20}$	5) $\sqrt{42}$
6) $\sqrt{50}$	7) $\sqrt{72}$	8) $\sqrt{95}$	9) $\sqrt{110}$	10) $\sqrt{143}$
11) $\sqrt{200}$	12) $\sqrt{59}$	13) $\sqrt{105}$	14) $\sqrt{98}$	15) $\sqrt{80}$

Solutions to Review Questions

- 1) 3
- 2) 11
- 3) a
- 4) $9x + 17$
- 5) d
- 6) 12
- 7) b
- 8) a
- 9) c
- 10) true
- 11) c
- 12) b
- 13) d
- 14) a
- 15) c
- 16) a
- 17) b
- 18) d
- 19) $5r$
- 20) b
- 21) a
- 22) $60pq$
- 23) 13
- 24) a
- 25) b
- 26) d
- 27) a
- 28) a
- 29) d
- 30) a
- 31) b
- 32) d
- 33) c
- 34) $-53 < a$
- 35) $y \geq -192$
- 36) true
- 37) b
- 38) a
- 39) d
- 40) c
- 41) $-1 \times 2 \times 3 \times 13 \times c \times d \times d$
- 42) b
- 43) $\frac{4p}{9q^2r}$
- 44) a
- 45) $36gh^2$
- 46) $-21s^5t^6$

- 47) b
- 48) b
- 49) d
- 50) c
- 51) a
- 52) b
- 53) $-3\frac{31}{250}$
- 54) about 135 miles
- 55) b
- 56) $3\frac{6}{7}$
- 57) $-6\frac{7}{12}$
- 58) $p \geq 1\frac{5}{24}$
- 59) 11:46 am
- 60) b
- 61) 9 ft 7 in
- 62) d
- 63) c
- 64) a
- 65) c
- 66) b
- 67) -8
- 68) d
- 69) a
- 70) $3\frac{1}{3}$
- 71) b
- 72) $n \leq -15.3$
- 73) inductive
- 74) a
- 75) b
- 76) a
- 77) c
- 78) b
- 79) d
- 80) c
- 81) d
- 82) d
- 83) 9 lessons
- 84) a
- 85) -4
- 86) $m \geq 7$
- 87) $b \geq 94$
- 88) c
- 89) b
- 90) c
- 91) c

- 92) b
- 93) a
- 94) c
- 95) d
- 96) 4
- 97) b
- 98) c
- 99) a
- 100) a
- 101) d
- 102) 7.5
- 103) b
- 104) 32.5%
- 105) d
- 106) b
- 107) \$22.50
- 108) \$608.75
- 109) about 30%
- 110) a
- 111) c
- 112) d
- 113) b
- 114) b
- 115) a
- 116) 30%
- 117) c
- 118) 87
- 119) 16
- 120) b
- 121) a
- 122) d
- 123) mode
- 124) c
- 125) a
- 126) b
- 127) d
- 128) 12 choices
- 129) b
- 130) c
- 131) $\frac{9}{36}$ or $\frac{1}{4}$
- 132) d
- 133) $\frac{5}{33}$
- 134) a
- 135) d
- 136) a
- 137) b
- 138) d
- 139) a

- 140) 37°
141) false
142) $\angle T$
143) 19.2 cm
144) 95°
145) d
146) c
147) d
148) c
149) d
150) a
151) d
152) b
153) a
154) 51.81 cm^2
155) $73\frac{5}{16} \text{ ft}^2$
156) c
157) 1921.68 m^3
158) a
159) b
160) a
161) c
162) d
163) -18
164) c
165) d
166) a
167) 26 cm
168) 63.7 m
169) b
170) d
171) 16.6 m
172) about 69.1°
173) b
174) d
175) $9c^2 - 15d$
176) $-21j^2 - 3k$
177) c
178) $-32y^3 + 20y^2 - 8y$
179) $4x^2 + 13x + 10$
180) Juanita, canoeing; Tracey, hiking; Sharon, tennis; Ramona, swimming.

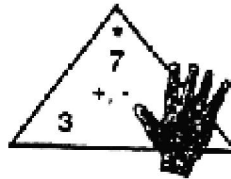
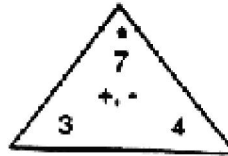
Multiplication/Division Fact Triangles

Fact Triangles

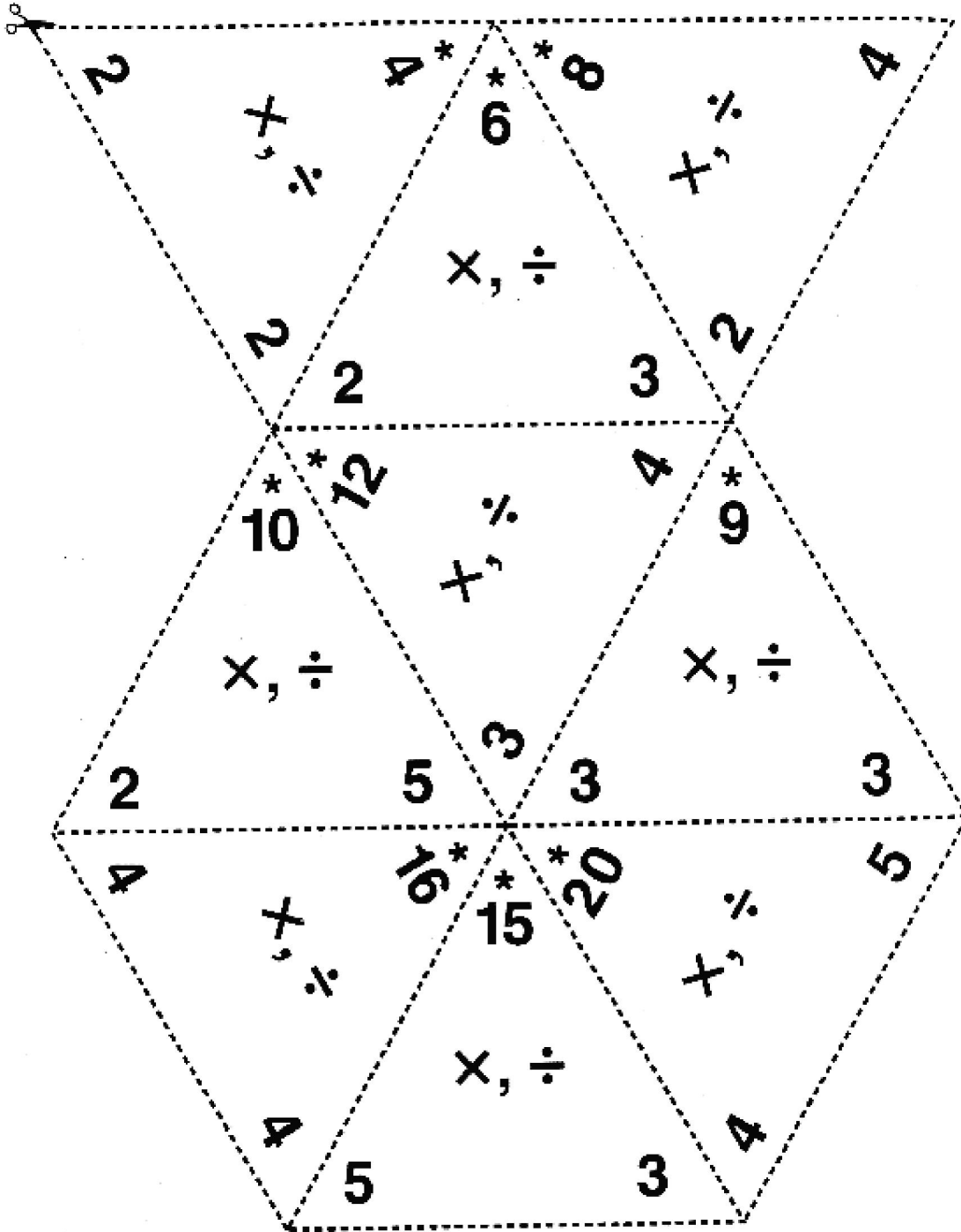
Facts may be mastered through the use of triangle fact cards. A triangle fact is pictured to the right. Fact triangles are a more effective device for memorizing the facts than ordinary flashcards because of their emphasis on fact families. The three numbers involved in an addition fact are placed on the corners of a fact triangle. The sum (answer) is at the top, under the asterisk (*). You cover one of the corners of the triangle. Then give an addition/subtraction fact that has the number you are concealing as its answer. For example, in the fact triangle pictured, you would say either "3+4=7" or "7-3=4." Similar fact triangles are used for multiplication.

A Fact Family

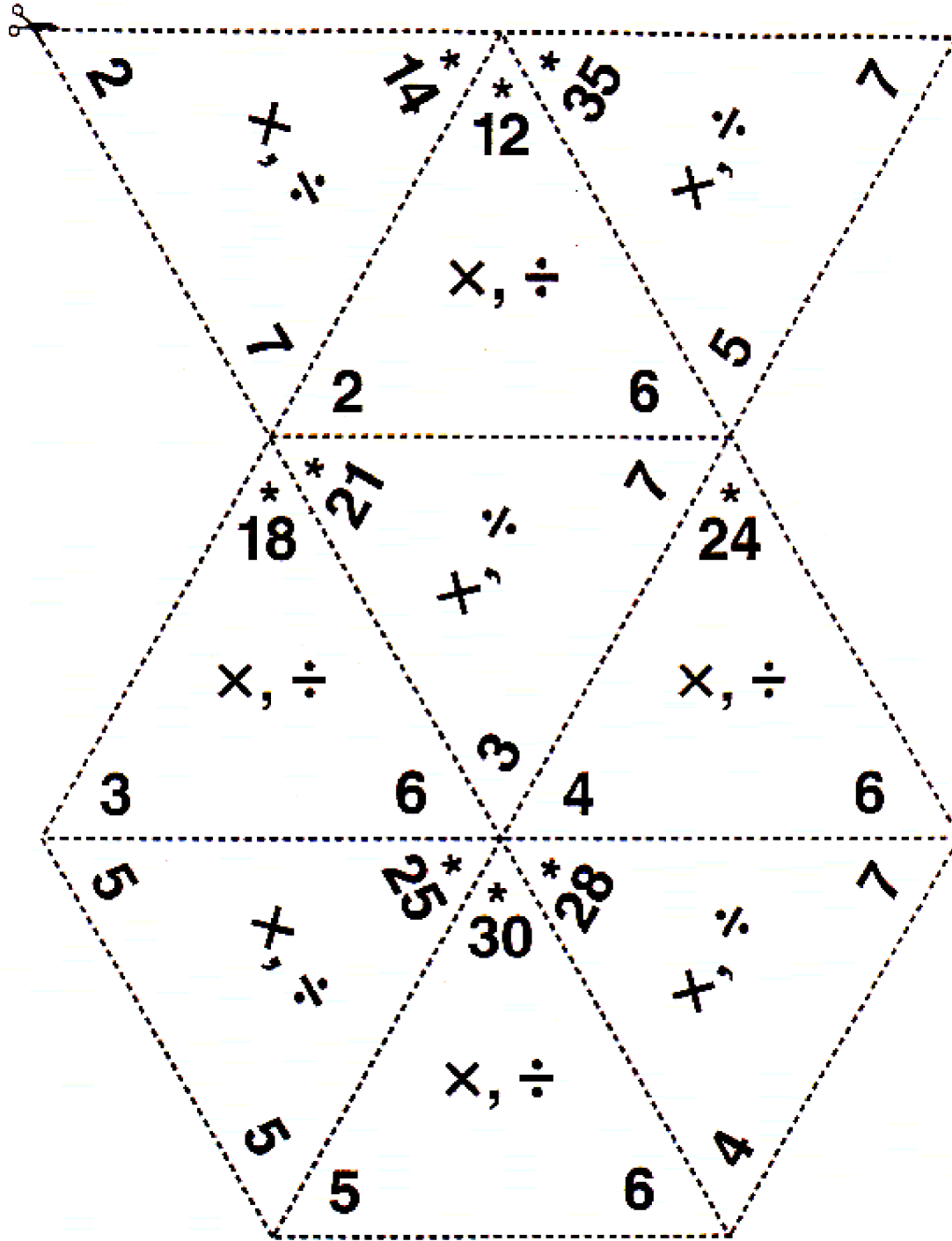
$$\begin{aligned} 3 + 4 &= 7 \\ 4 + 3 &= 7 \\ 7 - 4 &= 3 \\ 7 - 3 &= 4 \end{aligned}$$



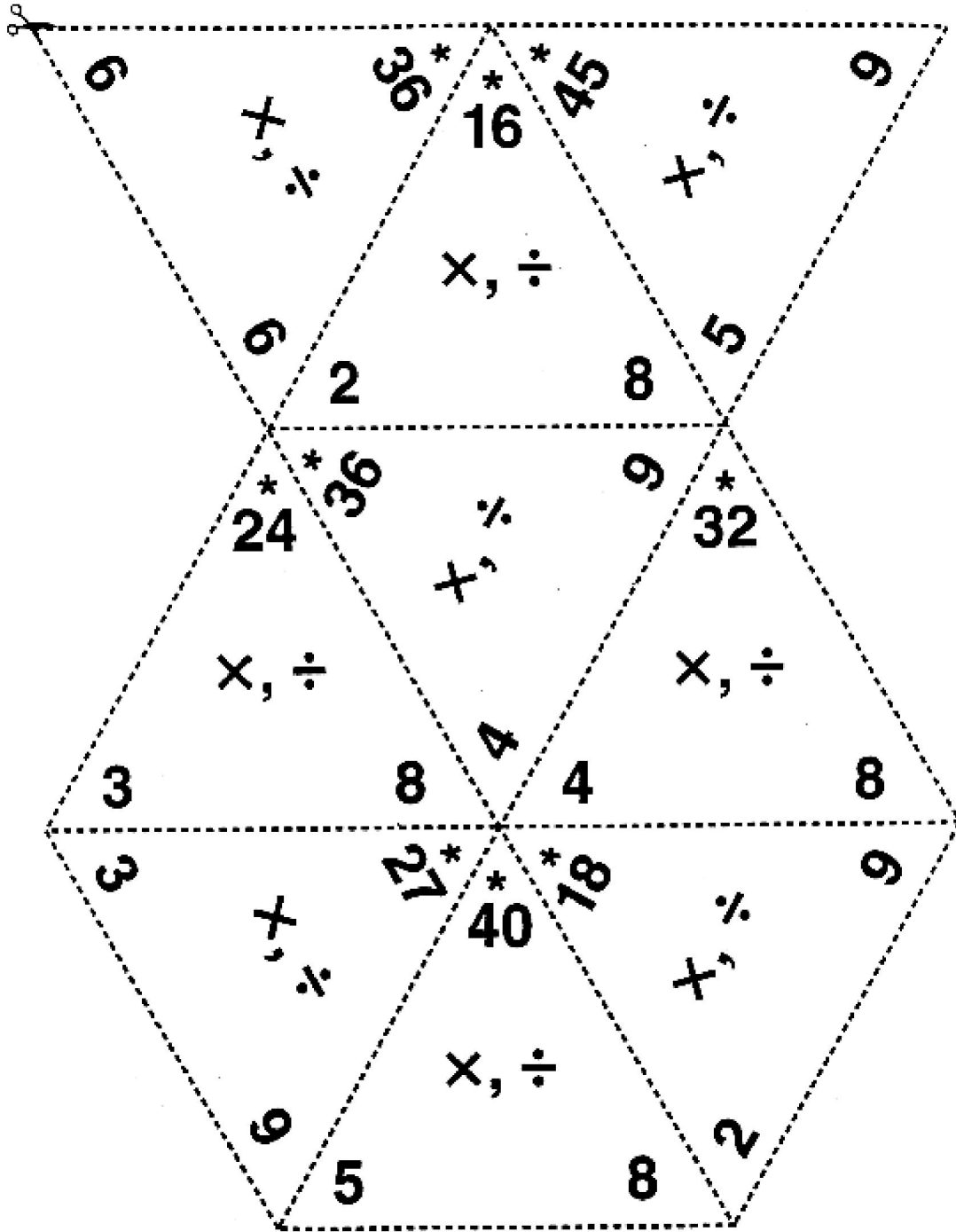
Multiplication/Division Fact Triangles



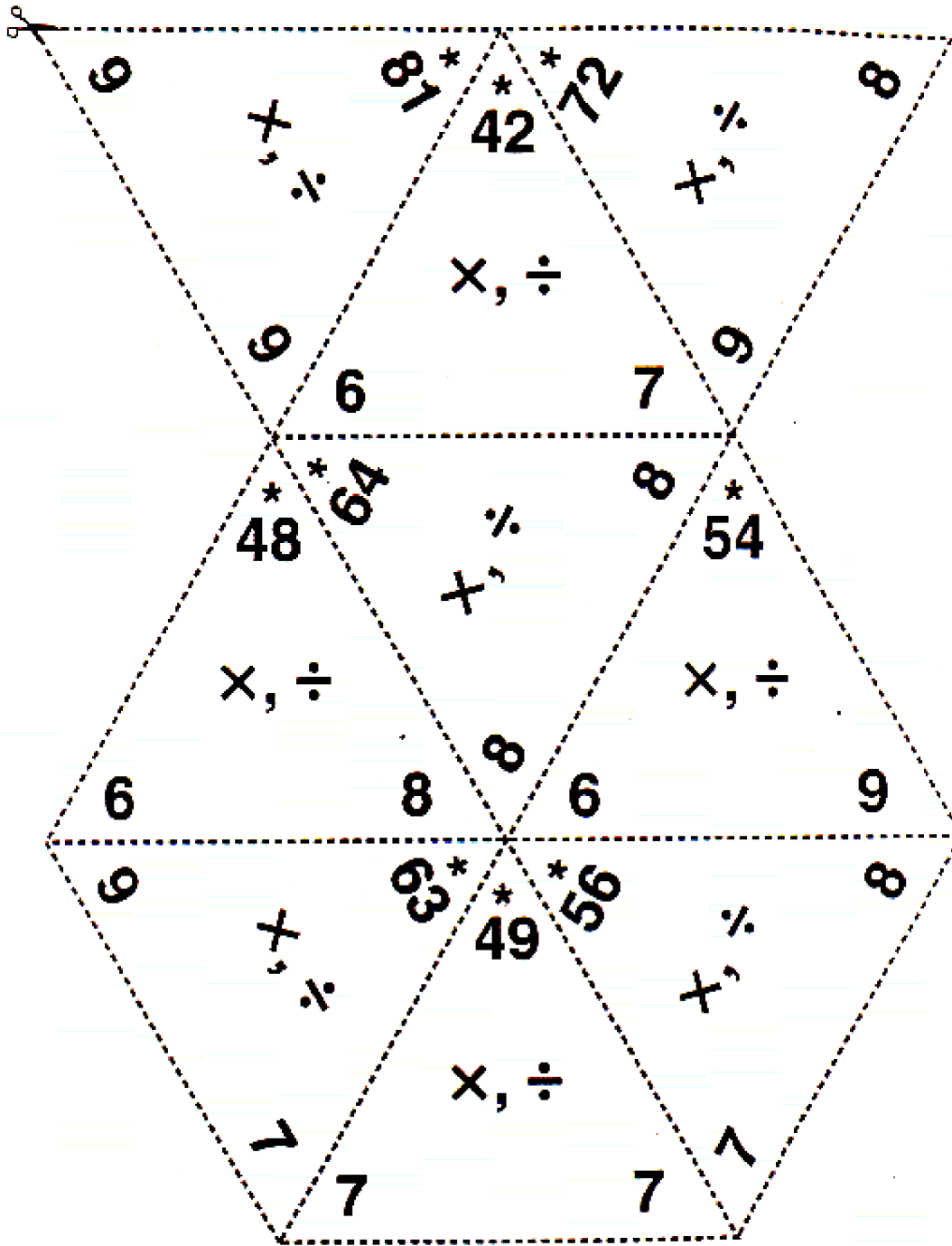
Multiplication/Division Fact Triangles



Multiplication/Division Fact Triangles



Multiplication/Division Fact Triangles



Facts Practice Using Addition/Subtraction Fact Triangles

This document contains directions and cut-out templates for the arithmetic facts from $2 + 2$ up to $9 + 9$ and their related subtraction facts



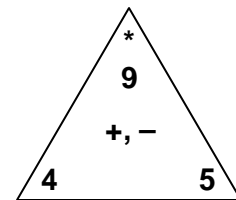
Warning!!! The reasoning (thinking) part of your brain can shut off under time pressure!!!

The goal of using these cards is to achieve accuracy and reasonable speed (3 to 5 seconds per fact). Use the cards to help assess which facts come reasonably quickly and which facts need more practice or connections to other known facts.

Whenever possible, combine thinking strategies with memorized smaller chunks such as combinations of 10 (To add 8 and 6, you can first add 8 and 2 to make 10 then add 4 more)

What are Fact Triangles?

- Fact triangles are a type of flash card that group together families of related arithmetic facts (“fact families”) like the one shown here:



What are “fact families”?

- $4 + 5 = 9$ is related to $5 + 4 = 9$ because addition is commutative ($a + b = b + a$).
- $4 + 5 = 9$ is also related to $9 - 4 = 5$ and $9 - 5 = 4$ because addition and subtraction are inverse operations.
- So 4, 5, and 9 make up the following family of four facts:

$4 + 5 = 9$
$5 + 4 = 9$
$9 - 4 = 5$
$9 - 5 = 4$

- Learning basic arithmetic facts in families reinforces the relationship between facts and requires significantly less memorization of isolated facts!

How might Fact Triangles be used to encourage thinking?

- Before practicing facts, the student must first understand what addition and subtraction represent and how they are related to each other.
- In each triangle, the sum (9 in the triangle above) is marked with a star (*). After cutting out the individual triangles, have the student write the fact family on the back of each triangle.
- In partners, one person shows the front side of a triangle while covering one number. The other person now identifies the missing number and the four facts in that fact family.

An example using the 4-5-9 card pictured above:

- Covering the starred number (9) requires the other person to find $4 + 5$ or $5 + 4$ and the related addition and subtraction facts.
- Covering the 4 requires the other person to find what number added to 5 is 9 or $9 - 5$ and the related addition and subtraction facts.
- Reinforce that the starred number is called the sum and the other two numbers are addends of that sum.

