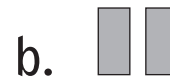
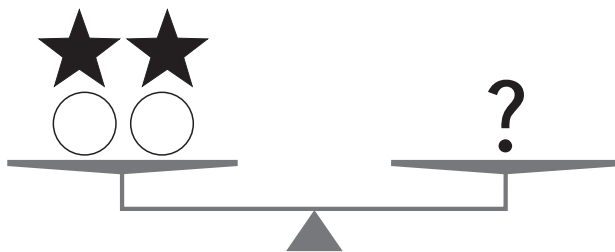
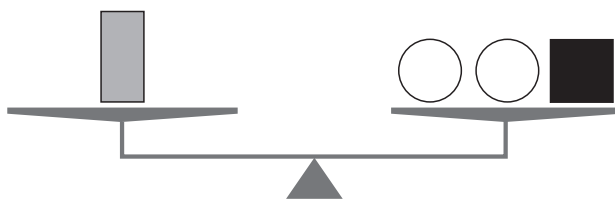
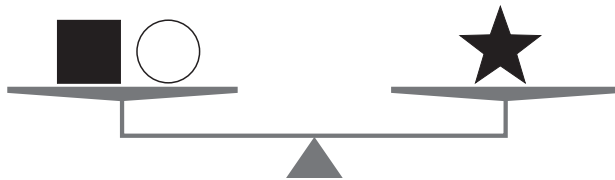




Which answer can replace the question mark?



Circle the two answers below that will always be true.

1. $\star\star\star = \blacksquare \text{ gray rectangle } \blacksquare$

2. $\circ \blacksquare \text{ gray rectangle} = \circ\circ\star$

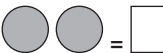


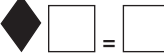






3. $\star\circ = \text{gray rectangle}$

4. $\star\star\circ\circ = \text{gray rectangle gray rectangle}$








Hint: From 1st balance, substitute \star for \blacksquare on 2nd balance.

Solutions









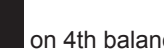



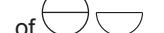
Page 1: b, 2, 4

Divide 2nd balance in half so  (Answer 2). On 1st balance, substitute  for  so . Remove  from both pans so . Double both pans so  (Answer 4). Substitute  for  so .

Page 2: c, 3, 4

From 1st balance, substitute  for  so .  (Answer 3). Remove  from both pans so  (Answer 4). Double this so .





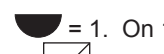

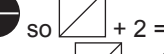
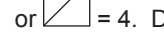
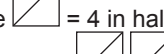
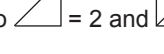
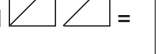

Page 3: b, 1, 3

From 3rd balance, substitute  for  on 1st balance so  (Answer 1) or . On 2nd balance, substitute  for  so . (Double for Answer 3.) From 1st balance, substitute  for  on 4th balance so . From above, substitute  for  for final answer of .









Page 4: b, 3, 4

From 1st balance, substitute  for  on 2nd balance so  (Answer 3). On 3rd balance, substitute  for  so . On 4th balance, substitute  for  so  (Answer 4).










Page 5: d, 2, 4

From 2nd balance, substitute  for  on 1st balance so  (Answer 2) or . Divide in half so . On 1st balance, substitute 2 for  so  + 2 = 6 or . Divide  = 4 in half so  and  = 6 (Answer 4). Therefore,  = 4 + 4 + 1 = 9.

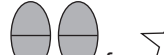



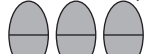

Page 6: c, 2, 4

Divide 1st balance in half so  =  (Answer 2). Triple so  =  (Answer 4) or . From 2nd balance, substitute  for  so .


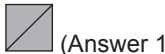











Page 7: b, 3, 4

Divide 1st balance into thirds so  = 4. On 2nd balance, substitute 4 for  so . Subtract 4 from both pans so  (Answer 3) or . On 3rd balance, substitute 3 for  so  or  (Answer 4). Therefore, .











Page 8: a, 2, 3

From 1st balance, substitute  for  on 3rd balance so  (Answer 2). From 2nd balance, substitute  for  so  (Answer 3).

Page 9: d, 1, 4

On 2nd balance, remove  from both pans so  (Answer 1). Substitute 10 for  so  or . On 1st balance, substitute 5 for  so . Subtract 5 from both pans so  or . If  and , then  (Answer 4) or .

Page 10: a, 2, 3

On 3rd balance, remove  from both pans so  (Answer 2). On 1st balance, substitute  for  so . Divide in half so  =  (Answer 3). From 2nd balance, substitute  for  on 4th balance so .